

IS LEPROSY INCREASING?

By

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CHARTS

Typical Causes of Death	Infant Mortality	Typhoid Fever
Cancer	Infantile Paralysis	Accidents
Influenza	Diphtheria	Mortality of the United States
Leprosy	Measles	and Germany
Malaria	Scarlet Fever	Pauper Burials
Tuberculosis	Whooping Cough	Army Anthropometry



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Leprosy in the United States

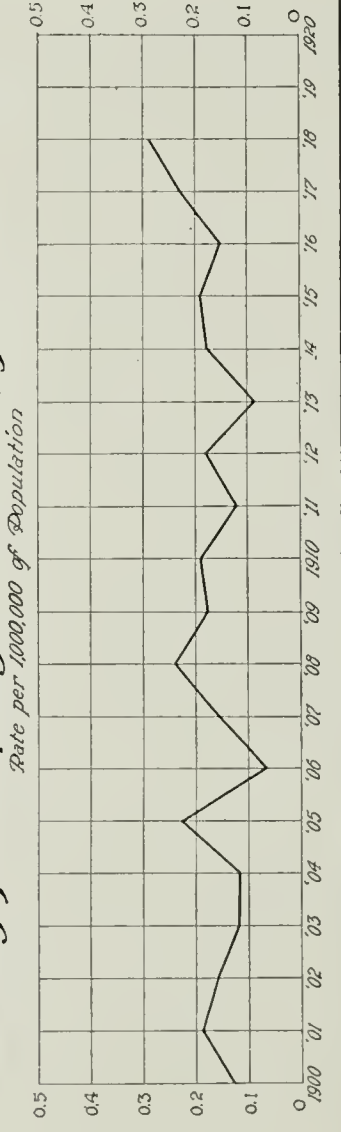
Number of Deaths from Leprosy
in the United States and Territories
for the period 1907-1918

State	Number	State	Number	State	Number
Alabama		New Mexico		Vermont	
Alaska		New York	19	Virginia	
Arizona		North Carolina		Washington	1
Arkansas		North Dakota		West Virginia	
California	37	Ohio	1	Wisconsin	3
Colorado		Oklahoma		Wyoming	
Connecticut	1	Oregon		<u>Territories</u>	
Delaware		Pennsylvania	5	Guam	
District of Columbia		Rhode Island	1	Hawaii	
Florida*	9	South Carolina*	7	Panama Canal Zone	615
Georgia		South Dakota		Philippine Islands	55
Idaho		Tennessee		Porto Rico	7500
Illinois		Texas		Samoa	
Indiana	2	Utah		Virgin Islands	
Iowa					
Kansas					
Kentucky					
Louisiana					
Maine	68				
Maryland					
Massachusetts	12				
Michigan	4				
Minnesota	7				
Mississippi					
Missouri					
Montana					
Nebraska					
Nevada					
New Hampshire					
New Jersey	1				

Number of Known Lepers
in the United States and Territories
on January 1, 1920

State	Number	State	Number	State	Number
Alabama		Iowa		New Hampshire	
Alaska		Kansas		New Jersey	3
Arizona		Kentucky		New Mexico	1
Arkansas		Louisiana	87	New York	28
California	39	Maine		North Carolina	
Colorado	3	Maryland		North Dakota	1
Connecticut	5	Massachusetts	13	Ohio	1
Delaware		Michigan	1	Oklahoma	
District of Columbia		Minnesota	10	Oregon	1
Florida	7	Mississippi	1	Pennsylvania	6
Georgia		Missouri		Rhode Island	
Idaho		Montana	1	South Carolina	2
Illinois	2	Nebraska		South Dakota	
Indiana		Nevada		Tennessee	
				Texas	33
				Utah	
				Vermont	
				Virginia	1
				Washington	1
				West Virginia	
				Wisconsin	2
				Wyoming	
				<u>Territories</u>	
				Guam	700
				Hawaii	
				Panama Canal Zone	80
				Philippine Islands	5500
				Porto Rico	50
				Samoa	
				Virgin Islands	

Mortality from Leprosy in the U.S. Registration Area



* Registration Cities

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IS LEPROSY INCREASING?

THE EXTENT OF LEPROSY IN THE UNITED STATES

The question as to whether leprosy is on the increase in this country is one of considerable medical, general scientific, and humanitarian interest. The question, unfortunately, can not be answered in a satisfactory manner by an appeal to thoroughly trustworthy statistics, for neither the Federal Government nor any one of the several States has undertaken an investigation commensurate with all that is involved in whatever answer may be forthcoming. At best only an approximate guess can be advanced as to the probable number of lepers in the United States at the present time, but it is safe to assume that the actual number is less than the earlier estimates would seem to justify. An attempt to answer the question by an appeal to statistical evidence was made at the time when the Senate Committee on Public Health and National Quarantine considered the establishment of a national leprosarium for the care of leprosy cases, chiefly of an international or interstate character. The results of several inquiries made of State and local boards of health throughout the country seem to indicate that there are probably not far from two hundred and fifty officially known cases of leprosy in the United States, and possibly as many as five hundred cases known and suspected. The United States Public Health Service has given publicity to similar inquiries but they have never been inclusive of all the States and the localities not required to report to some central authority.*

ESTIMATE BY DR. ISADORE DYER

Dr. Isadore Dyer, of New Orleans, probably the foremost leprologist in the United States, in his evidence before the Senate Committee on Public Health and National Quarantine, on March 26, 1916, referred to an estimate, according to which the number of cases of leprosy in the United States was four hundred, of which probably three hundred and fifteen were cases in the State of Louisiana. This, however, was a statement based upon inquiries made some years earlier, and Dr. Dyer in his evidence presented a revised estimate, according to which he placed the number of lepers throughout the United States in 1916 at from 800 to 1,200, basing his conclusions upon the observed experience and apparent rate of increase in the State of Louisiana.

ESTIMATE BY DR. HOWARD FOX

Dr. Howard Fox, of New York, Clinical Professor of Dermatology, also a recognized authority on leprosy, placed a statement before the same committee, according to which the number of leprosy cases in the

*In 1907 the United States Public Health Service traced 139 cases of leprosy in the continental United States. In 1912 the number so ascertained was 146. In 1920, according to my own inquiry, there are 242 cases. (See table XXIV, Appendix B.)

United States was estimated at from 500 to 1,000. Dr. Fox, however, apparently had based his estimates largely upon his experience in the city of New York, where some thirty cases had come under his personal observation. According to his estimate the number of cases of leprosy in the city of New York at that time was fifty.

ESTIMATE BY DR. MARTIN F. ENGMAN

Dr. Martin F. Engman, Professor of Skin Diseases, Washington University, St. Louis, testified that, in his judgment, an estimate of 800 leprosy cases in the United States was entirely too low, and he went so far as to intimate that the probable number was three times as large. In support of his statement he directed attention to a return of the United States Public Health Service for the year 1911, according to which there was only one case of leprosy in Missouri, when, to his personal knowledge, there were certainly at the time three cases in St. Louis alone. He, however, was frank to say that it was impossible "to estimate the number of cases of leprosy in this country with any accuracy at all."

THE UNITED STATES SENATE COMMITTEE INQUIRY

It would serve no practical purpose to enlarge upon the various estimates presented, since in not a single case has the evidence been forthcoming that a really thoroughgoing effort had been made to ascertain the facts. It was my privilege at about that time to present to the Senate Committee a first effort to assemble the leprosy statistics of foreign countries making at least fairly trustworthy returns, and a mass of material was printed in the report of the committee, which is still available to those who may wish to pursue the subject further. (Senate Report 306, 64th Congress, 1st session, Washington, 1916.)

THE LITERATURE OF LEPROSY

In continuation of the earlier investigation (Senate Report of 1916), I am now able to present some additional and more recent statistics, which, though largely for other countries than the United States, certainly emphasize the sinister aspects of leprosy occurrence in isolated cases as they are met with from time to time in this country. For, whatever views may be held regarding the spread of the disease, no one can question that leprosy foci, once thoroughly established, are extremely difficult, if not impossible, to eradicate. The literature of leprosy is widely scattered and difficult of access to those who suddenly find themselves confronted by the necessity of the highly specialized care of some isolated case of leprosy, usually, in this country, outside of Louisiana, contracted in the Philippines, Hawaii, or the West Indies.

Among the more important works which throw light and a wealth of useful information upon the etiology of this obscure disease, mention requires to be made of "A Handbook on Leprosy," by S. P. Impey, M.D., late chief and medical superintendent of the Robben Island Leper Asylum,

Cape Colony, South Africa. Another very useful dissertation is a report on leprosy in Hongkong, by James Cantlie, M.A., F.R.C.S., Hongkong, 1890. Of special value are the "Prize Essays on Leprosy," issued by the New Sydenham Society in 1897, including, first, a contribution to the history of leprosy in Australia, by J. Ashburton Thompson, M.D.; and, second, a report on the conditions under which leprosy occurs in China, etc., compiled chiefly during 1894, by James Cantlie. One of the most thorough investigations ever made into the subject is a report of the Leprosy Commission of India (Calcutta, 1893), which may well be considered a model for a similar inquiry in this country. This investigation includes the results of personal examinations and observations on the geographical distribution of leprosy in its relation to climate, soil and race, illustrated by properly drawn maps visualizing the local degree of frequency of the disease throughout India. The observations on the local incidence of leprosy are amplified by an extended consideration of such involved questions as hereditary transmission and predisposition, contagiousness, sanitation, diet, other diseases, and, finally, the important question of proper treatment. Through the courtesy of G. M. Young, Esq., Under-Secretary to the Governor of India, I have been favored with a copy of this valuable report, and of a supplementary memorandum prepared by a special committee in behalf of the National Leprosy Fund.

It is difficult to clearly grasp the significance of much of the general discussion relating to leprosy at a time when the views of highly respected authorities were widely at variance both as to the cause of the disease and the methods of its transmission. I need only refer to the treatise on "Leprosy and Fish Eating," by Sir Jonathan Hutchinson, and to even better purpose to the report on "Leprosy and Yaws in the West Indies," by Gavin Milroy, a fellow of the Royal College of Physicians, London, 1873; or, of more recent date, to the reports on "Nastin and Benzoyl-chloride Treatment for Leprosy," by Dr. E. P. Minett, Assistant Government Bacteriologist of British Guiana, London, 1912.*

MODERN VIEWS ON SEGREGATION

A review of the literature clearly emphasizes the inadequacy of the medical and general scientific considerations of a disease which, partly because of its obscurity and largely because of its more intensive limitation to primitive races, has not attracted the attention to which it is certainly, by every humane consideration, entitled at the present time. Even

*The modern literature of leprosy is so extensive as to preclude even a mere mention by title of the most important contributions, but a reference requires to be made to one of the Prize Essays on leprosy published by the New Sydenham Society, 1895, containing also an important paper by Doctor (now Sir) George Newman, on "The History of the Decline and Final Extinction of Leprosy as an Endemic Disease in the British Islands." The same volume includes a most interesting essay on "Conditions Under Which Leprosy has Declined in Iceland," by Edward Ehlers, M.D., and a paper on "Leprosy in South Africa," by S. P. Impey, M.D., with some supplementary observations on "Spontaneous Recovery from Leprosy," based upon self-cured cases, presented to the medical congress held in Cape Town. Of importance also is a contribution to the New Orleans Medical and Surgical Journal of July, 1917, on "Early Manifestations of Leprosy," by Doctor Ralph Hopkins, in medical charge of the Louisiana Leper Home. Invaluable in this connection are the special reports upon leprosy prepared by the United States Public Health Service, being the contributions made by the surgeons in charge of the United States Leprosy Investigation Station in Hawaii.

so useful and otherwise comprehensive a work as the new "Reference Handbook of the Medical Sciences" limits the discussion of leprosy by Dr. Dyer to less than six pages; but I may appropriately quote here Dr. Dyer's conclusion that, "The sanitary control of leprosy should be practiced by every government for the protection of the public and for the care of the leper. Segregation has proved the best method of checking the spread of the disease and this is the basis of the practice in most countries." He therefore remarks, "National leprosaria will solve the question of leprosy incidence, and the laboratory gives promise of finding some specific."

It was largely upon this principle of procedure that the small group of men who appeared before the Senate Committee in 1916 presented their case and carried their point, for be it said to the honor of the United States Congress that an appropriation was promptly made of \$250,000, an amount fully sufficient for the purpose. The bill was signed by the President on February 3, 1917.

In the arguments presented to the committee emphasis was placed upon the international aspects of the disease and the fact that, outside of the State of Louisiana, most, if not nearly all, of the sporadic cases of leprosy in the United States had been contracted in foreign countries or in our non-contiguous territories. It was chiefly on this ground that the Senate Committee made a favorable recommendation, it being clearly understood that it was not the intention of the States represented to place upon the Federal Government the burden of care in the case of leprosy clearly or unmistakably of native origin. This conclusion applies particularly to the State of Louisiana, where leprosy has been met with for more than a hundred years and where the disease has its largest endemic center in the United States.*

LEPROSY IN LOUISIANA

The Louisiana Leper Home was established by an act of the General Assembly of Louisiana, passed in the year 1894, the location of the home being near Carville, in Iberville Parish, about sixty miles from New Orleans, on the banks of the Mississippi River.

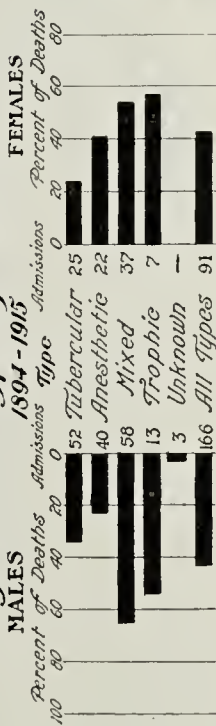
The number of new cases admitted to the Louisiana Leper Home in 1894 (being opened on December 1st) was only eight, but during the following year eighteen cases were admitted, and since that time the number has varied, reaching a maximum of twenty-seven new cases during the year 1913. The average number of cases admitted during the period 1895-1899 was seven, or 5.2 admissions per million of population per annum, which compares or contrasts with an average of twenty-one cases annually or 11.4 admissions per million during the five years ending with 1917. The number remaining in the institution at the time the report was made in April, 1916, was 103, or the largest number on record. The returns for

*There is record of a leper hospital at New Orleans as early as 1785. It has been claimed that the disease was introduced by the Acadian refugees from Nova Scotia after their expulsion by the English.

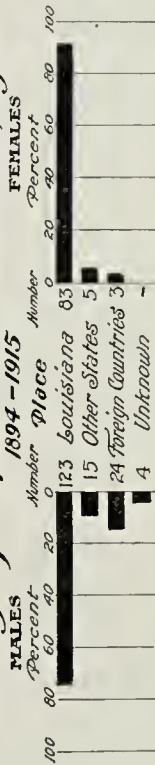
Leprosy in Louisiana

Inmates of Leper Home, Carville, La., 1894 - 1920

Deaths of Admitted Lepers from All Causes
by Sex and Type of Disease



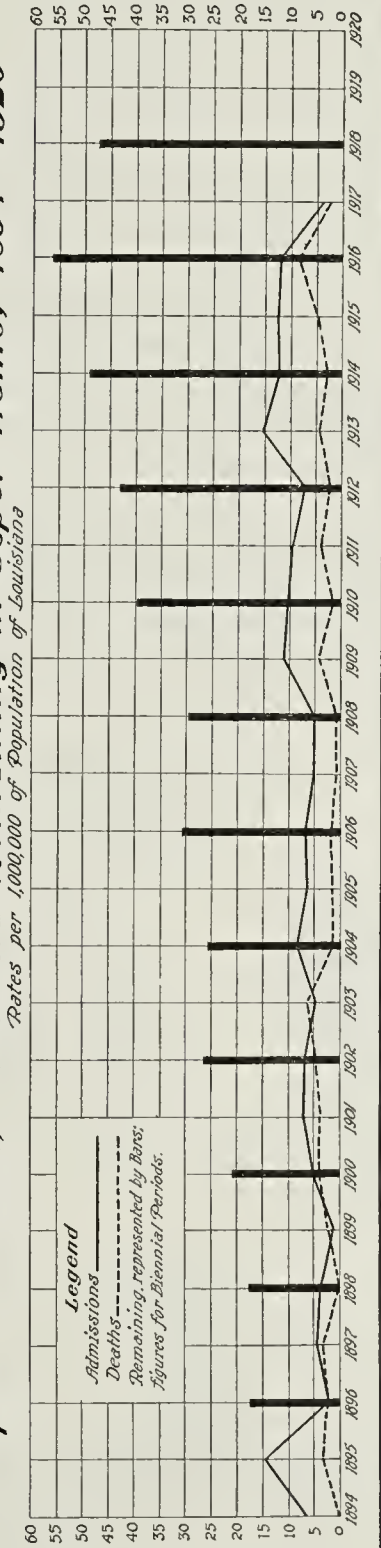
Nativity of Lepers on Admission, by Sex



Age of Lepers on Admission
by Sex



Lepers Admitted, Died and Remaining in Leper Home, 1894 - 1920



the year 1919 are not available at this writing, but they will subsequently be inserted as a matter of convenient record.*

The Louisiana data, which are given in full in table I of Appendix B, seem to justify the conclusion that leprosy is increasing in Louisiana; or, if not, that the number of non-segregated patients is larger than is generally assumed to be the case. This, as I understand it, is the view held by Dr. Dyer, whose judgment is entitled to the utmost consideration. It may be said in this connection that leprosarium admissions depend largely upon the reputation of the institution for the care and medical treatment of the patients as well as for the beneficial results secured in particular cases.

LEPROSY ADMISSIONS BY RACE, SEX AND AVERAGE AGE

The Louisiana Leper Home is in many respects an admirable institution, which has been fortunate enough to be under the supervision of a humane board conscious of its profound obligations towards the most afflicted members of the community. It has, furthermore, the great advantage of constant medical supervision on the part of Dr. Ralph Hopkins, who makes a weekly visit to the institution, and more often if urgently required. The table following presents an analysis of 257 cases admitted to the institution during the period 1894-1915, differentiating the type of the disease, the race and sex of the patient, and the average age on admission according to the diagnosed variety of leprosy:

ANALYSIS OF ADMISSIONS TO LEPER HOME, LA.

For the Period, December 1, 1894, to December 31, 1915

Average Age on Admission by Type of Disease

Type of Disease	MALES				FEMALES			
	White		Colored		White		Colored	
	No.	Av. Age Yrs.	No.	Av. Age Yrs.	No.	Av. Age Yrs.	No.	Av. Age Yrs.
Tubercular	38	32	14	39	18	42	6	41
Anesthetic	32	28	6	34	19	35	3	27
Mixed	46	33	10	41	30	36	6	31
Trophic	10	36	2	53	4	31	3	58
Unknown	2	40	—	—	—	—	—	—
Total	128	32.0	32	39.5	71	37.1	18	38.1
Ages Unknown	4	—	1	—	2	—	—	—

Males and Females

	No.	Av. Age Yrs.
Tubercular	76	36.4
Anesthetic	60	31.0
Mixed	92	35.0
Trophic	20 (x)	41.7
Unknown	2	40.0
Total	250	35.0
Age Unknown	7	—

(x) Includes one Chinese, age 75. (Male.)

Data from Biennial Reports of the Board of Control.

VARIETIES OF LEPROSY IN LOUISIANA

Of the 257 admissions, 205, or 79.8 per cent., were white persons. The corresponding proportion of whites in the total population of Louisi-

*The number remaining in 1920 is 37.

ana was 56.9 per cent. at the time of the 1910 census. The average age on admission, disregarding the type of the disease, was 32 years for white males and 39.5 years for colored males. For white females the average age on admission was 37.1 years, and for colored females, 38.1 years. There would, therefore, appear to be a tendency towards a somewhat higher age on admission in the case of the colored patients.

Combining both races and sexes, of the 257 admissions, 77, or 30.0 per cent., were of the clearly differentiated tubercular variety, 62, or 24.1 per cent., were of the anesthetic variety, and 95, or 37.0 per cent., were of the mixed variety, the proportions varying according to race and sex, but it is safe to say that the mixed variety is the predominant type. The fact that the mixed variety predominates complicates the question of treatment and makes segregation even more important than would ordinarily be the case. The mixed variety apparently has a slightly higher average age on admission, while the anesthetic variety has a lower age than the tubercular for both sexes and both races separately considered.

THE FATALITY RATE IN LEPROSY

The next table shows an analysis of the experience during the period 1894-1915, indicating the fatality ratios and the cures, with a due regard to sex and type of disease:

ADMISSIONS TO THE LOUISIANA LEPER HOME

According to Type of Disease, Mortality, and Cures

December 1, 1894, to December 31, 1915

Males					
Type of Disease	Admissions No.	No.	Died %	No.	Cured %
Tubercular	52	18	34.6	2	3.8
Anesthetic	40	9	22.5	4	10.0
Mixed	58	38	65.5	1	1.7
Trophic	13	7	53.8	—	—
Unknown	3	—	—	—	—
Total	166	72	43.4	7	4.2
Females					
Tubercular	25	6	24.0	6	24.0
Anesthetic	22	9	40.9	4	18.2
Mixed	37	20	54.1	2	5.4
Trophic	7	4	57.1	—	—
Unknown	—	—	—	—	—
Total	91	39	42.9	12	13.2
Males and Females					
Tubercular	77	24	31.2	8	10.4
Anesthetic	62	18	29.0	8	12.9
Mixed	95	58	61.1	3	3.2
Trophic	20	11	55.0	—	—
Unknown	3	—	—	—	—
Total	257	111	43.2	19	7.4

DISCHARGES AND CURES

The interesting fact is brought out by this table that of the total male admissions, numbering 166, seven cases, or 4.2 per cent., were discharged as cured. Of 91 females, twelve cases, or 13.2 per cent., were discharged as cured, but it is hardly safe to draw far-reaching conclusions according to the type of the disease and the apparent degree of curability, with reference to sex, on account of the smaller number of women patients under observation. In the case of male patients, however, it is significant that the proportion of deaths should have been highest for the mixed type of the disease, or 65.5 per cent. of the admissions, the corresponding percentage for females having been 54.1. For the tubercular type of the disease, the mortality rate was 34.6 per cent. for males and 24.0 per cent. for females. The fatality rate, of course, is largely influenced by the duration of treatment and the attained age of the lepers under segregation, as well as by the rate of admission of new cases. No definite conclusions can be drawn from this experience as to the greater or lesser degree of curability of specified types of leprosy, but the method used emphasizes the value of an extended statistical analysis of the facts derived from a larger area of observation. For all types combined the mortality rate was 43.4 per cent. for male patients and 42.9 per cent. for female patients, or almost the same.

Many other interesting facts are brought out by the statistical tables appended to this discussion, which are practically self-explanatory. Without unduly enlarging upon the facts as disclosed by table II, Appendix B, it may be said in this connection that the age period at which the larger proportion of leprosy admissions occurred in Louisiana was 20-29. At this period of life there were 34 admissions, or 20.5 per cent. of the total of 166 male admissions, while of 91 females the greatest number was admitted at ages 40-49, but almost the same number was admitted at ages 20-29. A discussion of the statistical results of this investigation is naturally difficult on account of the race factor, which can not be safely ignored, but an extended consideration of which would unduly trespass upon the time available, and more so in view of the fact that the details are given in the tables in the appended tabular analysis.

ABSCONDING CASES

It has not been possible for me to deal with the question of escapes, but from every center of leprosy the information is clearly to the effect that escapes are not only inadequately safeguarded against but in some cases encouraged. The Early case of the District of Columbia is a conspicuous illustration of our failure to recognize the menace of leprosy to the community at large. Most of the cases apprehended have previously been unrecognized leper residents of other communities. In Louisiana last year fifteen cases absconded, but what became of these cases is not known. In California last year at least three cases, and probably more, escaped from detention hospitals. It is always a foregone conclusion that an

escaped leper will be apprehended within a comparatively short period of time on account of the urgency of the special treatment required to bring relief. In view, however, of the recognized infectious character of the disease, or its transmission from person to person by actual contact, the danger to the community on account of such cases is real and not imaginary.*

DEPORTATIONS

I am not able to discuss in full detail the question of deportations. The reports of the Surgeon General do not indicate how many lepers are annually deported. Under the law a foreign-born leper must be a resident of this country five years before he acquires a settlement. Most of the cases of foreign-born lepers have been residents of this country for many years, although the disease was unquestionably contracted abroad. Accurate information would be of value, for unquestionably leprosy importations would be discouraged if the facts of deportation were better understood. It would also be of value to have the duration of previous residence in this country accurately ascertained to determine whether cases should be deported that now are a burden and expense to communities ill-provided with proper facilities for leprosy care. The question may be raised in this connection whether our methods of examination for leprosy at quarantine are really adequate to the purpose. It does not appear that special emphasis is placed upon the urgency of ascertaining cases of leprosy in the incipient stage of the disease. It is possible that the Bureau of Immigration has information on the subject, for the records should show the number of cases refused admission to this country on account of leprosy, as well as the number deported.

LEPROSY IN THE YOUNG

One important phase of the subject is leprosy in the young. There are in this country at the present time a number of very suggestive cases of children suffering from leprosy evidently contracted from leprous parents. There are or were two or three such children at the Alameda County Hospital, Oakland, Cal., and there are at present two such children at Phillipsburg, N. J., ill-provided with the required special institutional care. Since a leper under certain conditions may live for many years with the disease in a quiescent or arrested stage the pecuniary aspects of this question are a matter of serious importance to the localities concerned.

*The importance of this observation is illustrated by the very recent case of Willard Centliver, a leper, who surrendered to the authorities of the City of Washington, as reported in the Washington Post of March 28, 1920. He had arrived in Washington a few days before from Birmingham, Alabama, having made the trip in a Pullman car, but he had destroyed the car check so as to preclude the identification of the method by which he had evaded detection. This man was accepted for army service in New Orleans in 1917, having subsequently been transferred to Camp Beauregard, Louisiana. His condition being ascertained, he was sent to the Louisiana Leper Home from which he escaped and went to Houston, Texas. From there he returned to New Orleans and subsequently by way of Birmingham reached Washington, where he entered a clinic and reported his condition. He could give no explanation as to how or where he had contracted the disease.

TREATMENT AND CURE

The question of treatment and cure does not fall within the present discussion but it has an important bearing upon the problem of leprosy increase in that the numbers remaining are naturally determined in part by the results of institutional care. There is apparently a distinct tendency towards a larger proportion of cases discharged as cured, or certainly in an arrested condition of the disease, justifying a diagnosis of at least relative harmlessness to the community at large. In proportion, however, as cases to an increasing extent are discharged as cured the number remaining would indicate a diminished frequency of leprosy in the community, although the contrary might be the case. This fact is frequently overlooked in discussions of leprosy increase, and care is therefore necessary in considering the statistical results.

LEPROSY IN CALIFORNIA

One of the most important centers of leprosy in the United States is the Isolation Hospital at San Francisco, where generally from fifteen to twenty lepers are segregated by the County of San Francisco, there being in addition some nine lepers at the County Hospital of Alameda County, near Oakland. The leprosy cases in San Francisco show no material increase during recent years, but there are reasons for believing that cases are not effectively segregated, but apprehended in other counties, as best illustrated by some very interesting apprehensions in Fresno, in the heart of the San Joaquin Valley; and even more so by the Los Angeles County Hospital, where at the present time five lepers are under control. Details regarding the San Francisco cases are appended hereto (table III, Appendix B), but it must be kept in mind that it is always more difficult to secure trustworthy data for institutions which care for only a small number of cases, not on the basis of adequate leprosy segregation but rather on the principle of isolation and quarantine control.

LEPROSY IN MASSACHUSETTS

Some exceptionally interesting data are available for the Massachusetts Leper Colony at Penikese Island, in Buzzard's Bay, where the number under segregation is generally about twelve, but probably somewhat higher at the present time, a maximum having been reached in 1913, when fifteen cases were under segregation.* Some interesting details of racial origin, age, and type of disease, are also included in the appendix (table IV, Appendix B.)

LEPROSY IN THE UNITED STATES REGISTRATION AREA

The foregoing statistics indicate the best sources of leprosy information for the United States, but there can be no question of doubt that the disease is widely scattered and that obscure cases occur here and there, though frequently erroneously diagnosed or not recognized at all except

*Number under segregation on January 1, 1920 was 13, with 2 more cases reported during the month.

in the terminal stage of the disease. It may be pointed out in this connection that in the United States registration area, with a population of about 82,000,000 in 1918, there occurred twenty-four deaths from leprosy, equivalent to a rate of 0.29 per million of population. The rate in the registration area has apparently increased gradually from 0.13 in 1900 to 0.19 in 1910, and, as stated, to a maximum figure of 0.29 in 1918. (Table V, Appendix B.) *

REVISED ESTIMATE OF LEPROSY CASES IN THE UNITED STATES

If the normal death rate of leper cases is placed at 80 per 1,000 under segregation, then the twenty-four deaths from leprosy which occurred in the United States in 1918 would be equivalent to 300 probable cases of leprosy in the registration area, and if this figure is applied to the continental United States, the number of leper cases, on a very conservative basis, is not less than 400.

The distribution of leprosy deaths in the registration States, by single years, since 1900, is given in table VI of Appendix B, but the fact must not be overlooked that some of the States have been included in the registration area during recent years only. The inadequacy of this return is made clear by the statistics for the State of New York, where unquestionably a larger number of deaths from leprosy occur than the recorded two deaths, for illustration, during 1918. There has been for many years an attitude not far from indifference on the part of the New York authorities towards the imperative medical and humane duty of segregation, which is so much more lamentable since it is safe to assume that there are certainly not less than thirty and possibly as many as fifty cases of leprosy in the city of New York at any given time. That cases in the city of New York are of national concern is shown by sporadic outbreaks. Cases in New Jersey, for illustration, have been directly traceable to leprosy contact on Blackwell's Island. There are at the present time two leper children in Phillipsburg, N. J., whose mother died from the disease in the city of New York.†

If, therefore, the available statistical evidence is not entirely conclusive it is certainly extremely suggestive of a possible, though slowly increasing, frequency of this most dreaded of all human afflictions. The experience which has been had in other countries proves conclusively that leprosy increases as long as segregation is neglected, but that the disease slowly declines when the cases are brought under control in one or more carefully supervised institutions such as the act of February 3, 1917, provides shall be established in the United States under the direction of the United States Public Health Service.

*Of course, not all lepers die of leprosy, so that the reported figure is an understatement of the whole truth of leprosy occurrence in the registration area. See table IX, Appendix B, for Barbados.

†For the official viewpoint that leprosy is not contagious or infectious in this climate, see J. A. M. A. of November 13, 1897, p. 1021, and November 27, 1897, p. 1126.

URGENT NEED FOR A FEDERAL LEPROSARIUM

The urgency of a federal leprosarium is not questioned by anyone familiar with the facts. It requires only to be considered that during the period 1907-18 there have been not less than 138 deaths from leprosy in the United States registration area, which is exclusive of a considerable rural and Southern section in which leprosy cases are likely to occur. Delay in the establishment of a federal institution for the care of lepers must therefore be considered, on humane as well as on medical grounds, a wrongful indifference on the part of those who are responsible for the execution of the law. The obstacles to the selection of a suitable site can not be considered serious, and least so in the case of Ship Island, Miss., where there are suitable buildings which could long since have been converted into a most useful institution for the care and relief at least of interstate and international leprosy cases throughout the South. Before I enlarge upon the practical aspects of the question of adequate care under segregation it may not be out of place to direct attention to certain facts of leprosy occurrence throughout the Western Hemisphere which bear directly upon our own problems at home.

LEPROSY IN CANADA

There has for many years been a very limited leprosy center in the Province of *New Brunswick*, dating back certainly as far as 1815, and probably to a much earlier period. As many as thirty-two lepers were segregated at Shell Island about 1844, and these were later transferred to the present leprosarium at Tracadie, where twenty-one lepers were cared for in 1863. As the result of segregation the number of patients has gradually diminished to twenty-four in 1898 and fourteen in 1916 with no new admissions for the two years preceding the date of the last return. In 1907 the Canadian government assumed federal control over all leprosy cases, and a lazaretto was established at Darcy Island, B. C., for the care of cases on the Pacific coast. There have been sporadic cases of leprosy in Manitoba, chiefly of Icelandic or Scandinavian origin. It may be questioned whether there are more than twenty-five active cases of leprosy throughout Canada at the present time. There were five cases at Darcy Island in 1919 and thirteen cases at Tracadie.

LEPROSY IN CUBA

In *Cuba* there occur probably fifty deaths from leprosy per annum, equivalent to a rate of 20 per million of population. As far as it is possible to judge the disease is slightly on the increase, partly because of the lack of adequate methods of segregation, although probably more is done by the Republic of Cuba than in the United States. In Cuba leprosy appears to affect chiefly the white population, for in 1914 there were thirty-five deaths of white lepers to ten deaths from leprosy among the negroes. (See tables VII and VIII, Appendix B.) *

*According to the Bulletin of the Pan-American Union for September, 1916 "The construction of a new leper hospital building was provided for at an expense not exceeding three hundred thousand dollars." In January, 1917, the lepers under segregation at the lazaretto in the city of Havana remonstrated against their proposed removal to the new institution at Mareal. Out of one hundred and seventy-four lepers, it is said twenty escaped.

LEPROSY IN PORTO RICO

In *Porto Rico* leprosy is fairly common, the number of known cases being thirty-nine in 1919, or 30.9 per million of population. This compares with about 154 known leper cases per million population for Cuba, but the evidence of an increase in the frequency of the disease is much more pronounced for Porto Rico, or, for illustration, a rate of 17.3 for 1905 contrasts with 24.3 for 1912 and 30.9 for 1919. (See table IX, Appendix B.)*

LEPROSY IN PANAMA CANAL ZONE

In the *Panama Canal Zone* leprosy is also of relatively common occurrence, the lepers being segregated in a settlement at Palo Seco, near the canal entrance, including, however, admissions of Panamanians from the republic at large. The number of cases remaining under observation in 1918 was seventy-six, or 693 per million of population, a very marked excess over the known rates for Cuba and Porto Rico. There were eight deaths from leprosy in 1918, equivalent to a rate of 72.9 per million of population, which compares with the rate of 19.7 for Cuba for the year 1914. The returns for the Panama Canal Zone also indicate an increase, at least in the recorded frequency of leprosy, the rate having been 137.1 for 1907, 348.6 for 1913, and 692.6 for 1918. The Palo Seco returns, however, are not entirely complete in that sporadic cases of leprosy are occasionally taken care of in the hospitals of the Panama Canal Zone. It may be said in this connection that the prevailing variety of the disease in Panama is tubercular, or twenty-four deaths out of thirty-three during the period 1907-1915; while an overwhelming proportion of admissions is represented by native Panamanians and negroes, there having been only three deaths of white persons during the period under review out of a total of thirty-three deaths of all races and nationalities. Two of the white decedents were natives of the United States.

The Senate report on leprosy contains much information concerning the frequency of the disease throughout the West Indies, which to enlarge upon would unduly trespass upon the time available for the present discussion. It seems advisable, however, to briefly direct attention to the leprosy returns for certain countries of South America, which are deserving of more consideration than has heretofore been given to the relative frequency of the disease in the Pan-American republics. (See tables X and XI, Appendix B.)

*The lepers of Porto Rico are isolated on Cabras Island at the entrance of San Juan Bay. In 1917, however, this institution had only thirty-four patients. The Journal of the Porto Rico Medical Association quoted in the Journal of the American Medical Association of 1918 contains the report of a committee appointed to investigate leprosy conditions in Porto Rico. This report brought to light decidedly unsatisfactory conditions, particularly as to the water supply and accessibility. The committee recommended that the present site be abandoned and that the lepers be removed "to a fertile portion of the mainland of Porto Rico," and that "principles of modern sanitary management be applied to the care and treatment of the disease in place of the present state of hopeless isolation." The New York Times of April 13, 1919, contains an account of this colony reflecting seriously upon existing conditions, stating the sanitary conditions to be deplorable and directing attention to the totally inadequate medical supervision. The article concludes with the statement that "Common human kindness should prompt the authorities of Porto Rico to have the unfortunates transferred to some other place, where at least they could keep dry in damp weather." and, it is said, "Surely these poor outcasts need some one's help."

LEPROSY IN RIO DE JANEIRO

For *Rio de Janeiro* the statistics indicate a relative mortality from leprosy of about 30 per million of population, there having been twenty-three deaths from this disease in 1918. The returns are available since 1890 and indicate neither a pronounced tendency towards an increase nor a decided diminution. It may therefore be said that the disease has apparently reached a stationary condition, in Rio de Janeiro at least, while for Recife (Pernambuco), the available data indicate a decided decrease since 1907, from a rate of 112.9 per million of population to 37.5 in 1917. (See table XII, Appendix B.)

LEPROSY IN SAO PAULO

For the city of *Sao Paulo*, however, the returns are less reassuring, for there the condition also appears to be apparently a stationary one. In 1901 the number of deaths from leprosy was equivalent to 17.5 per million, but by 1910 the rate had increased, probably due largely to more accurate methods of reporting, to 65.6. In 1917 the rate was 57.5 per million, but apparently the changes in the rates can not be relied upon as a definite indication of an increase or decrease in the frequency of the disease. (See table XIII, Appendix B.)

LEPROSY IN BRAZIL

Some interesting statistics are available for the *Federal District of Rio de Janeiro*, for the period 1909-18, indicating a relative annual mortality from leprosy of 27.9 per million of population for males and 18.8 for females. The rate increases with age, as shown by a table hereto appended, from a minimum mortality in infancy to a maximum mortality in advanced adult life. (Table XIV, Appendix B.)

In addition, there is included a table of leprosy mortality in the Federal District of Rio de Janeiro, by nativity, showing, at least for the male population, a decided tendency towards a higher rate on the part of the natives, but the data are not sufficient for entirely safe conclusions. (Table XV, Appendix B.) They would seem to indicate, however, a lesser disease liability on the part of the native Brazilians than on the part of the foreign-born. The same conclusion applies to the relative frequency by race, but in this case the fact must not be overlooked that the age distribution of the mixed population may possibly be much at variance with the corresponding distribution of the pure white or black population. (See table XVI, Appendix B.) *

*Under date of August, 1919, a report was issued to the effect that a new and model leprosarium was under construction in Santo Angelo "which will be the best of its kind in all South America and have all facilities for the isolation and treatment of lepers." Under date of January 10, 1920, the American Medical Association, quoting from a Brazil medical periodical, states that a committee had reported: "We question whether it is advisable to leave lepers in their homes under special surveillance or [not better] to segregate them." Further directing attention to the beneficial results of segregation in Norway, where in fifty-seven years the number had been reduced to less than three hundred cases. It is said that "In Norway the central government has control over the whole country, and uniform methods of surveillance could be applied." The report however, emphasizes that conditions in Brazil are very different, there being no uniformity possible in the twenty states of Brazil under existing conditions. Hence "the conclusion that segregation is the only practical system for the prophylaxis of leprosy." But the committee urges that the leprosariums should be easy of access to friends and attractive.

LEPROSY IN ARGENTINE REPUBLIC

Some very interesting statistics are also available for *Argentina*, where a national conference on leprosy was held in Buenos Aires in 1906, when the number of lepers throughout Argentina was returned as 724. Of this number, 272 cases were found in the Province of Corrientes, 144 in the Province of Buenos Aires, and 123 in the federal capital. Between 1906 and 1916 there were 350 cases of leprosy treated in the hospitals of the Republic of Argentina.*

LEPROSY IN VENEZUELA

In *Venezuela*, so far as the death rate can be relied upon, there is apparently a tendency towards a decline, for the highest rate, for 1905, was returned as 31.0 per million of population, while by 1912 it had been reduced to 22.5, and in 1918 to 9.8. In the meantime, however, the number of inmates at the leper asylum has not undergone a material change, there being 666 cases in 1907, or 251.3 per million of population, against 582, or 211.2 per million, in 1912, and 753, or 262.5 per million, in 1918. (See table XVII, Appendix B.)†

LEPROSY IN BARBADOS

Thus the evidence is quite sufficient to emphasize the conclusion that leprosy in the Western Hemisphere is endemic and possibly on the increase, and that therefore no country, and particularly no port of entry, can be considered safe or immune against the risk of a possible further introduction of the disease into this country from nearby republics with which our commercial relations are constantly expanding.‡ The disease prevails in Costa Rica, in Venezuela, on the west coast of South America, in Dutch Guiana, and in practically all the West Indies, and particularly in the island of Barbados, which is a source of considerable emigration to this country. In Barbados the disease appears to be stationary, but evidence is not wanting that lepers from Barbados have been apprehended in the

*According to the Journal of the American Medical Association for November 15, 1917, no successful attempt is apparently made in Argentina to isolate all the lepers but it is planned "to construct a large leprosarium with accommodations for five hundred patients in the Chaco district." The report protests against an inland leper colony of this kind on the ground that "it is just adding fuel to the fire," and suggests that "the leper colony should be on some island apart from the centers of population and every member should be given land. It should be a free farming community except that the inmates should not be allowed to leave the island."

†There are two leprosariums in operation in Venezuela. The largest is on the Isla de Providencia, located just outside of the harbor of Maracaibo, with accommodations for seven hundred patients. The other is at Cape Blanco, about four miles from Lagaira.

‡The most interesting statistics of leprosy are those available for certain provinces of India. According to the census of the Northwest Frontier Province there were three hundred and forty-four cases of leprosy in 1881, diminishing to two hundred and seventy-six in 1891, increasing slightly to two hundred and ninety-four in 1901 and diminishing again to two hundred and eighty-two by 1911. It is observed in the return that "in the case of leprosy we could find no persistent tendency in any direction towards an increase or a decrease in the frequency of the disease." But in this connection it is said that "it is in the case of leprosy that the danger of wilful concealment is greatest, especially when the leper is a female of respectable status." This would explain the lower ratio of women lepers almost invariably met with where trustworthy data are available." It is pointed out that "errors of diagnosis no doubt detract from the accuracy of the figures, for it is often difficult to distinguish leprosy from other diseases which exhibit similar symptoms, such as leucoderma and syphilis." In this connection there may be quoted the further observation that "The causes which predispose to the disease do not seem to have been accurately determined; and no correspondence could be traced between the physical and climatic conditions or between the race or the staple diets of the inhabitants of the tracts of India in which leprosy was found to be especially common." (See appendix A and table XIX, Appendix B.)

United States. During the period 1890-1917, 426 lepers have died in Barbados, and of this number, 246 were males and 180 were females, an overwhelming majority of the cases being of the tubercular variety, or 291 out of a total of 426. The average duration of treatment was longest in the anesthetic type, or 9.6 years for males and 11.5 years for females; but for the tubercular type the average length of treatment was only 4.5 years for males and 4.8 for females. The Barbados figures are of special value in that, through the kindness of the authorities, I have been furnished with a return in detail as to the causes of death, with distinction of type, the facts being given in table XVIII, Appendix B, appended hereto as an interesting contribution to a phase of the leprosy subject which has heretofore received totally inadequate consideration. In many of the discussions of leprosy it is not clear whether the references are to lepers, or deaths from leprosy. As shown by the Barbados returns, of the total number of deaths of lepers from all causes, or 426, the number of deaths from causes other than leprosy was 165, or 38.7 per cent.

NATIONAL CONFERENCE ON LEPROSY IN ARGENTINA*

These considerations suggest the urgency of a much more qualified and extended interest in the leprosy problem than prevails at the present time. It is twenty-two years since the first leprosy conference was held in Berlin, which was followed by the Bergen conference in 1909, and it is nearly fourteen years since the great National Leper Conference was held in the Argentine Republic. The report on that conference, by Dr. Carlos G. Malbran, constitutes an invaluable source of trustworthy information amplified by interesting maps illustrating the relative frequency of leprosy occurrence in the sections of the Argentine Republic most affected by the disease.

GEOGRAPHICAL DISTRIBUTION IN BRAZIL

Another valuable report on the geographical distribution of leprosy in South America has been made by Dr. Carlos Da Costa Ribeiro under date of May, 1918, to the Secretary of the Interior and Justice of Brazil. This report includes a map illustrating the distribution of leprosy throughout the State of Ceara for the year 1918, indicating the unsuspected frequency occurrence of the disease, made even more suggestive by a map of the city of Fortaleza, showing the distribution of existing cases throughout the entire community.

URGENCY OF A BROADER NATIONAL INTEREST

Conferences and reports of this kind are in marked contrast to our own indifference to a subject which should arouse the medical, general scientific, and humanitarian interests in all who are concerned with problems of health and human welfare. For a time the United States Public Health Service published an important series of special reports on the results

*Confereencia Sobre la Lepra, Buenos Aires, 1908.

of the work at the leprosy investigation station in Hawaii, but apparently in recent years little has been done that is entitled to special consideration. There is an immense mass of information which has not been subjected to critical analysis or brought within the reasonable compass of a report readily within the understanding of those who are seriously concerned with the question as to whether the disease is actually on the increase in this country and the enhanced risk of its introduction from abroad.

RECENT CASES OF LEPROSY THROUGHOUT THE UNITED STATES

Without enlarging further, for the time being, upon the international aspects of leprosy occurrence, there is presented here a summary statement of the cases of leprosy reported in this country since April, 1916*.

This formidable list of about 250 cases can not be considered complete or free from unavoidable duplications. The reports of the United States Public Health Service give no indication whatever as to the personal facts of most of the cases, so that one report can not be checked by another. It would be very desirable if in every case the Public Health Service would give the initials of the patient and, if possible, some very simple data as to the nativity and racial origin, the age and sex, and the type of the disease.

URGENCY OF A MORE QUALIFIED PROFESSIONAL INTEREST

The reports emphasize the need of a better knowledge regarding the diagnostic indications of leprosy if serious errors are to be avoided. Reference may here be made to an article in the Brazilian Archives of Medicine for November, 1918, on incipient leprosy, in which Mourao described, with illustrations, what he calls "A New Sign of Leprosy," the details of which are set forth in a brief article in the Journal of the American Medical Association. If there is much need of better diagnosis, there is the utmost urgency for a better understanding of the exact facts of leprosy occurrence on the part of the general public. It is unfortunately true that many of the cases reported are set forth in sensational terms, causing undue alarm on the part of those who can not possibly be expected to understand the essential facts of a disease which, fortunately, is still of rare occurrence in this country. Conversely, however, there is as much danger in underrating the importance of isolated cases, as, for illustration, in the statement by the late surgeon-general of the United States Public Health Service with reference to the Early case, that "though leprosy is a disease to be dreaded it is not a national menace" in the same sense that venereal diseases, etc., are, which, though true, leads nevertheless to erroneous conclusions on the part of the general public.† *Leprosy is a serious menace to this nation* and, however much guarded against by modern methods of sanitary living and sanitary precautions, it is a danger to any one and all who may have the misfortune to come in contact, know-

*Most of these cases are from the weekly Sanitary Reports of the United States Public Health Service.

†See footnote on page 13.

ingly or unknowingly, with patients suffering from the disease from its incipient to its terminal stage. I can not do better than quote in this connection from a cable despatch to the New York Sun, dated Honolulu, November 11, 1919, a part of a pitiful story of a white woman recently apprehended as a leper, and now, and probably for the remainder of her life, at Molokai. This woman was the daughter of a former minister of foreign affairs under King Kalakaua. She had been a leper since she was five years of age, had been taken to Japan, but later on had been returned to her mother's home, where she lived and was cared for until her mother's death, when she was apprehended by the authorities and deported in accordance with the law. Such cases occur every now and then in Hawaii, clearly illustrating that the danger of disease transmission is not limited to the lower class native element or to the foreign-born.

CASES OF LEPROSY IN THE UNITED STATES REPORTED SINCE 1916

LOCATION AND DATE REPORTED	REMARKS
Baltimore, Md., April 13, 1916.	Dr. M. S. Rosenthal reported a colored boot-black afflicted with leprosy at Mercy Hospital. Included in his report is the statement that, "This case well illustrates the urgent need of a national leprosarium, where these unfortunates can find a permanent refuge and the community be spared the presence of an unsightly, mutilated and incurable human being awaiting the final call."
New Orleans, La., April 15, 1916.	One case.
" April 29, 1916.	"
Lake End, La., April —, 1916.	Negro woman.
Boston, Mass., April —, 1916.	Native of Harput, Turkey. Sent to Penikese Island.
New York City, May 6, 1916.	One case; one death.
" June 3, 1916.	One death.
Mansfield, La., June —, 1916.	Colored male.
Minneapolis, Minn., June —, 1916.	Chinese, native of Otagu, Japan, in United States nine years. Lived in Montana until he came to Minneapolis, March 7, 1916. Leprous symptoms began during convalescence from severe burn due to gasoline explosion in 1911. No history of leprosy in patient's family.
San Francisco, Calif., July 15, 1916.	American, had come from Denver four years previously. Left for Louisville, Ky., June 7, 1916.
" July 15, 1916.	One case.
Los Angeles, Calif., July 15, 1916.	"
White Fish, Mont., July —, 1916.	Chinese.
Boston, Mass., Aug. 11, 1916.	Cuban student, removed to Penikese Island.
Bellingham, Wash., Aug. 19, 1916.	A Greek who had been in the United States more than three years.
New Orleans, La., Aug. 19, 1916.	Two cases reported.
Yokohama, Japan, Aug. 22, 1916.	Twenty-five cases of Americans with leprosy reported in different parts of Japan.
Galveston, Texas, Aug. 26, 1916.	One case.
Los Angeles, Calif., Aug. 26, 1916.	"
San Francisco, Calif., Sept. 2, 1916.	"
" Sept. 30, 1916.	Two cases.
New Orleans, La., Sept. 30, 1916.	One case.
" Oct. 7, 1916.	"
Seattle, Wash., Oct. 7, 1916.	"

LOCATION AND DATE REPORTED	REMARKS
New Orleans, La., Oct. 14, 1916.	One case.
Milwaukee, Wis., Nov. 2, 1916.	Creek.
Los Angeles, Calif., Nov. 11, 1916.	One case.
New Haven, Conn., Nov. 20, 1916.	Case reported by Dr. John E. Lane, confirmed by Dr. C. J. Bartlett, of the Yale University Medical School. It is said in this connection that: "The chief interest in this case is the illustration of the fact that leprosy patients wander about for a long time without being recognized, as a majority of the physicians have never seen a case of the disease, and quite naturally do not suspect it."
New Orleans, La., Nov. 25, 1916.	One case.
New York City, Nov. 25, 1916.	Two cases.
Newark, N. J., Dec. 2, 1916.	Syrian.
New York City, Dec. 2, 1916.	One case.
Ansonia, Conn., Dec. 9, 1916.	Case reported by Collaborating Epidemiologist Black, of the Connecticut State Board of Health.
Indianapolis, Ind., Dec. 10, 1916.	Naval veteran of the Civil War. Case diagnosed by a young interne—Dr. C. V. Kemp—at Long Hospital, who had never previously seen leprosy.
San Francisco, Calif., Dec. 12, 1916.	One case.
" Dec. 16, 1916.	"
Fort Branch, Ind., Dec. 21, 1916.	Native of Indiana, but formerly lived in Alaska, Mexico, and Panama Canal Zone.
Williamsport, Pa., Dec. 30, 1916.	One case.
Oakland, Calif., Dec. —, 1916.	Three cases.
New Orleans, La., Dec. —, 1916.	Two cases.
San Francisco, Calif., Jan. 13, 1917.	One case.
" Jan. 20, 1917.	"
New York City, Feb. 3, 1917.	"
Jersey City, N. J., Feb. 10, 1917.	"
New Orleans, La., Feb. 10, 1917.	"
Los Angeles, Calif., Feb. 10, 1917.	"
New Orleans, La., Feb. 17, 1917.	"
San Diego, Calif., Feb. 17, 1917.	Mexican, transferred to Los Angeles County Hospital.
Milwaukee, Wis., Feb. 21, 1917.	One case.
San Francisco, Calif., Feb. 24, 1917.	"
Jersey City, N. J., Feb. —, 1917.	"
New Orleans, La., (Parish) Feb. —, 1917.	Three cases notified during the month.
" March 3, 1917.	One case.
New York City, March 17, 1917.	"
San Francisco, Calif., March 24, 1917.	"
Springfield, Mass., May 10, 1917.	Syrian, who had escaped from City Hospital, Newark, N. J., largely because of inadequate precautions and otherwise unsuitable surroundings.
Richmond, Contra Costa Co., Calif., May 14, 1917.	One case.
Oakland, Calif., May 17, 1917.	Chinese case.
Los Angeles, Calif., May 26, 1917.	Mexican.
New Orleans, La., May 26, 1917.	Two cases.
New York City, May 26, 1917.	One case.
Los Angeles, Calif., June 9, 1917.	Hawaiian case.
Klamath Falls, Ore., June 14, 1917.	Italian, formerly living in Spokane.
New York City, June 16, 1917.	One case.
Burtville, E. Baton Rouge Parish, La., June —, 1917.	Negro.
Los Angeles, Calif., July 13, 1917.	Japanese woman, resident for about one year.

LOCATION AND DATE REPORTED	REMARKS
Phillipsburg, N. J., July 17, 1917.	Two cases, originally discovered on Blackwell's Island, N. Y. Children of a woman, also a leper, whose cause of death had been certified as embolism, although the symptoms were similar to those of the disease in the children. (See also Newark Evening News, April 12, 1918.)
Los Angeles, Calif., July 21, 1917.	One case.
New York City, July 26, 1917.	Greek, who came to United States in 1913.
Syracuse, N. Y., Aug. 17, 1917.	Two cases reported, brothers, natives of Greece, formerly residents of New York City. (One of these escaped August 15, because of inadequate precautions.)
White Pine County, Nev., Aug. 17, 1917.	One case.
Garyville, St. John Parish, La., Aug. —, 1917.	Father and three brothers of this patient had previously been sent to the State Lepers Home.
Providence, R. I., Sept. 14, 1917.	Native of Italy, resident of this country five years.
New Orleans, La., Sept. 29, 1917.	One case.
San Francisco, Calif., Oct. 13, 1917.	"
Biloxi, Miss., Oct. 18, 1917.	This man was employed as oyster shucker when discovered, having followed that occupation for past six years.
Alberton, Mont., Oct. 19, 1917.	One case.
San Francisco, Calif., Oct. 27, 1917.	"
" Nov. 10, 1917.	"
New Orleans, La., Nov. 17, 1917.	"
Williamsport, Pa., Nov. 19, 1917.	Sicilian, in United States eleven years. Isolated outside of city.
Galveston, Texas, Dec. 1, 1917.	One case.
Bennettsville, S. C., Dec. 15, 1917.	"
Long Beach, Miss., Dec. —, 1917.	Native and former resident of Louisiana.
Jersey City, N. J., Jan. 30, 1918.	Native of Germany, formerly a resident of Brooklyn, who died by suicide day following.
Portland, Ore., Feb. 9, 1918.	One case.
New Orleans, La., Feb. 16, 1918.	"
" Feb. 23, 1918.	"
Jersey City, N. J., Feb. 25, 1918.	Negro woman from West Indies. This was the third case for some time past reported to local authorities, one having been a Mexican, and second case, also apparently a foreigner, who committed suicide.
West Haven, Conn., Feb. —, 1918.	One case.
Galveston, Texas, March 2, 1918.	"
Oakland, Calif., March 2, 1918.	"
New Orleans, La., March 9, 1918.	"
" March 13, 1918.	"
" March 23, 1918.	"
Los Angeles, Calif., March 23, 1918.	"
San Francisco, Calif., March 23, 1918.	"
Los Angeles, Calif., April 9, 1918.	"
" April 13, 1918.	"
San Francisco, Calif., April 20, 1918.	"
Riverside, Calif., April 23, 1918.	"
Louisville, Ky., April 27, 1918.	"
Philadelphia, Pa., April 29, 1918.	One death.
Boston, Mass., May 7, 1918.	Native East Indian.
New Orleans, La., May 25, 1918.	One case.
Rio Vista, Calif., May —, 1918.	Native Hawaiian, age 14; had lived in the islands 3½ years.

LOCATION AND DATE REPORTED
Fresno, Calif., May —, 1918.

San Francisco, Calif., May —, 1918.

Abilene, Texas, June 8, 1918.

Bridgeport, Conn., June 8, 1918.

New Orleans, La., June 8, 1918.

“ June 29, 1918.

Alexandria, La., June 29, 1918.

Boston, Mass., June 29, 1918.

“ June —, 1918.

Bridgeport, Conn., June —, 1918.

Avoyelles Parish, La., June —, 1918.

Oakland, Calif., July 13, 1918.

“ July 27, 1918.

Mandeville, La., July —, 1918.

New Orleans, La., July —, 1918.

Oakland, Calif., July —, 1918.

Boston, Mass., July —, 1918.

New Orleans, La., Sept. 21, 1918.

“ Sept. 28, 1918.

Dayton, Ohio, Sept. —, 1918.

Tyron, N. C., Sept. —, 1918.

Boston, Mass., Oct. 29, 1918.

Glendale, Ariz., Oct. —, 1918.

Boston, Mass., Nov. 2, 1918.

Galveston, Texas, Nov. 2, 1918.

New York City, Nov. 9, 1918.

New Orleans, La., Nov. 13, 1918.

“ Nov. 16, 1918.

Los Angeles, Calif., Dec. 21, 1918.

“ Feb. 2, 1919.

Braddock, Pa., Feb. —, 1919.

New Orleans, La., March 8, 1919.

San Francisco, Calif., March 8, 1919.

Philadelphia, Pa., March 15, 1919.

District of Columbia, March —, 1919.

Galveston, Texas, April 19, 1919.

Philadelphia, Pa., April 21, 1919.

New Orleans, La., April 26, 1919.

San Francisco, Calif., April 26, 1919.

“ April —, 1919.

question, in California. Case reported by Dr. Howard Morrow, of San Francisco.

Stockton, Calif., April —, 1919.

REMARKS

Two cases; one a native woman of Mexico, and one a Chinaman, of Louisiana.

Chinaman, resident in United States eight years.

One case.

“

“

“

“

“

Two cases. One a native of China, and one a Russian.

Greek, resident of United States for past four years.

One case. Transferred to Louisiana State Leper Colony.

One case.

Two cases.

“

One case.

Two cases. Chinamen; natives of Hawaii, possibly previously reported from other localities.

Two cases. One from nearby state, sent to Penikese Island.

One case.

Two cases.

Greek, formerly resident of Columbus, Ohio.

Famous Early case, Early had escaped from Washington, D. C.

Native of Cape Verde Islands.

Native Mexican.

One case.

“

One death.

One case.

“

“

“

“

“

Native of Philippine Islands.

One case.

One case. Patient died of smallpox, March 22, 1919.

White woman, life-long resident of Galveston.

Syrian, reported as having disappeared, probably with intention to reach New York.

Peddler, apparently same case as reported from Springfield, Mass., and Newark, N. J.

One case. Died.

“

“

Native Californian who had never been outside the State, being one of three cases known to have been contracted, without

Native of Stockton, whose brother is suspected of being a leper, and whose father had leprosy at the time of his death in 1912.

LOCATION AND DATE REPORTED
Hartford, Conn., April —, 1919.

New Orleans, La., May 3, 1919.
New York City, May 3, 1919.
Philadelphia, Pa., May 3, 1919.
Portland, Ore., May 3, 1919.
Monte Rio, Calif., May 4, 1919.
San Francisco, Calif., May 8, 1919.
Boston, Mass., May 10, 1919.
New York City, May 10, 1919.
San Francisco, Calif., May 10, 1919.
Boston, Mass., May 24, 1919.
San Francisco, Calif., May —, 1919.
El Centro, Calif., May —, 1919.
San Francisco, Calif., June 7, 1919.
Los Angeles, Calif., June 10, 1919.
“ June 14, 1919.
Baltimore, Md., June 14, 1919.
New Orleans, La., June 21, 1919.
Philadelphia, Pa., June 21, 1919.
Orleans Parish, La., June —, 1919.
St. Martin Parish, La., June —, 1919.
Contra Costa County, Calif., June —, 1919.
New Orleans, La., July 12, 1919.
Boston, Mass., July 14, 1919.

San Francisco, Calif., July 26, 1919.
“ July —, 1919.
Santa Rosa, Calif., July —, 1919.
LaFayette, La., July —, 1919.
Olympia, Wash., July —, 1919.
New Orleans, La., Aug. 2, 1919.
Sacramento, Calif., Aug. 16, 1919.
San Francisco, Calif., Aug. 16, 1919.
Lansing, Mich., Aug. 30, 1919.

New York City, Aug. —, 1919.
Galveston, Texas, Aug. 30, 1919.
Otero County, Colo., Aug. —, 1919.
Beloit, Wis., Sept. 6, 1919.
Benton Harbor, Mich., Sept. 6, 1919.
Los Angeles, Calif., Sept. 6, 1919.
New York City, Sept. 13, 1919.
New Orleans, La., Sept. 13, 1919.
Los Angeles, Calif., Sept. 27, 1919.
San Francisco, Calif., Sept. 27, 1919.
“ Oct. 4, 1919.
Los Angeles, Calif., Oct. 11, 1919.
Houston, Texas, Oct. 18, 1919.
Boston, Mass., Nov. 1, 1919.
Los Angeles, Calif., Nov. 1, 1919.
New York City, Nov. 1, 1919.
Pueblo, Colo., Nov. 1, 1919.
New Orleans, La., Nov. 8, 1919.
San Francisco, Calif., Nov. 8, 1919.
Ann Arbor, Mich., Nov. 13, 1919.
Los Angeles, Calif., Nov. 22, 1919.
New Orleans, La., Nov. 22, 1919.
Charlotte, N. C., Nov. 29, 1919.

REMARKS
Native of Trinidad, West Indies, formerly resident of Providence and Boston.
One case.
“
“
Chinaman, born in San Francisco.
Mexican.
One case.
Two cases and one death.
One case.
“
“
One case. (Patient escaped to Mexico.)
One case.
Mexican.
One death.
“
One case.
One death.
Two cases.
One case.
“
“
Case reported of a leper who escaped from the Detention Hospital, subsequently apprehended in Philadelphia.
One case.
Mexican male.
Formerly resident of Hawaii.
One case.
“
“
“
“
One case. Formerly U. S. soldier who had been in service in Philippines.
One case.
“
“
“
One death.
One case.
Native of Porto Rico.
One case.
One case; one death.
One case.
“
Two cases.
One case.
“
“
One death.
One case.
“
One death.
“
One case.
Two cases.
One case.

LOCATION AND DATE REPORTED	REMARKS
St. Joseph, Mo., Nov. 29, 1919.	One case.
Cambridge, Wis., Nov. —, 1919.	Second case reported in State, by Dr. Cornelius A. Harper, of Madison.
Chicago, Ill., Nov. —, 1919.	One case.
Pinos Altos, N. M., Nov. —, 1919.	"
La Junta, Colo., Dec. 6, 1919.	Mexican.
Galveston, Texas, Dec. 6, 1919.	One death.
Ann Arbor, Mich., Dec. 13, 1919.	One case. (Possibly previously given.)
Christiana, Wis., Dec. —, 1919.	One death. (Originally diagnosed June 3, 1919.)
Boston, Mass., Jan. 22, 1920.	One case, formerly of Rome, N. Y. Worker in chocolate factory.
Tilden, Neb., Jan. 29, 1920.	Spanish War veteran.
Boston, Mass., Jan. 31, 1920.	Second case reported within fortnight; cement worker from Baltimore; sent to Penikese Island.
San Francisco, Calif., Jan. 31, 1920.	One case.
Dayton, Ohio, Feb. 29, 1920.	According to the <i>Cleveland Leader</i> , case being cared for at present time at Dayton. A Greek, whom it is proposed to return to his native country. Stated in same dispatch that there had been a leper in same locality—Mexican—who had escaped several months ago.
New York City, March 7, 1920.	According to <i>Bronxborough News</i> of March 7th there are at present time 22 cases of known leprosy in New York City, subject to practically no restrictions or supervision, being allowed to walk about the streets of the city on the assumption that "the disease can not develop in this climate." This, of course, is a serious error, for leprosy develops in any climate and under any conditions of life, as far as known, where there is exposure to existing cases, or contact, since the disease is known to be transmissible, although the exact method of transmission remains a mystery.*
Muskogee, Okla., March 13, 1920.	A negro suspect escaped from Coffeyville, Kans., was apprehended by local health authorities.
Lansing, Mich., March 26, 1920.	One case. Native of Lansing.
New Orleans, La., April 15, 1920.	Two cases. Found by city health officials while awaiting "treatment" at the hands of a faith healer.

NEED AND VALUE OF A NATIONAL LEPROSY CONFERENCE

The preceding list of cases should arouse the interest of an indifferent public, an indifferent medical profession, and a public health service far from being as active as the needs of the present situation demand. Whether leprosy is actually on the increase or not is secondary to the question that the disease occurs with a sufficient degree of frequency throughout practically the whole United States to demand a change from public apathy, little short of a crime. Other countries, in which a much lesser number of cases occur, make adequate provision and render adequate reports with a reasonable assurance that measures of control are more effective than they are apparently in this country at the present time. The example of Argentina may well be followed in this country, for only a national conference thoroughly representative of all the interests concerned can arouse the American public to a danger that confronts future generations if new endemic centers are allowed to be created. It is not a problem for a

*The actual number of cases in New York City at the present time is 28.

city or a State to solve, but a matter of the utmost national and international concern. Much good unquestionably resulted from the international leprosy conferences of 1897 and 1909, and a similar conference called at the present time, even if limited to the Pan-American republics, would unquestionably prove productive of far-reaching results. But if such a congress could be made inclusive at least of the countries of the Far East, and if held in the United States, the best thought of the present day would be concentrated upon an agreement as to the course of procedure likely to prove most advantageous to the patient and the public directly concerned.

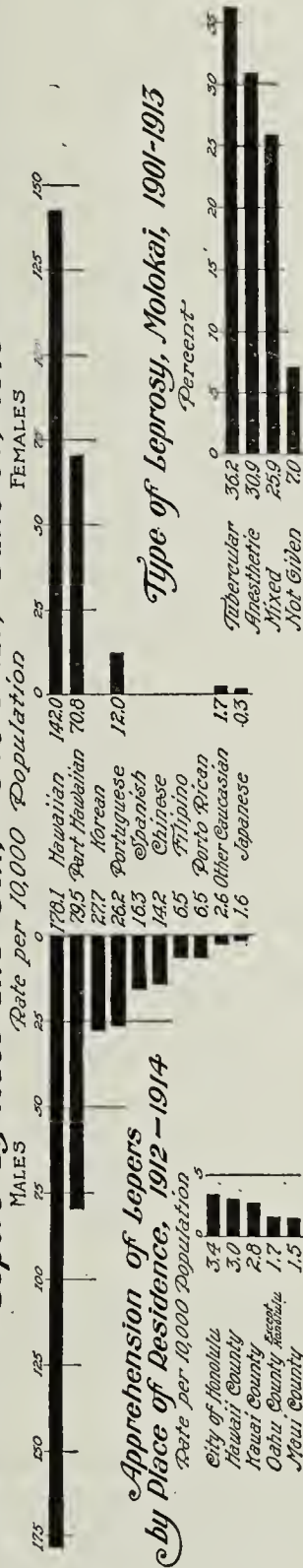
I may in this connection direct attention to a remarkable address on "Leprosy: A New View of Its Bacteriology and Treatment," by T. S. Beauchamp Williams, M.D., contributed to the Indian Medical Gazette for May, 1911, as an illustration of much neglected phases of the subject in this country. At the same time, I may recall an excellent outline of fundamental principles, by Dr. Isadore Dyer, set forth in an address on "The Dermatologic Aspects of Leprosy," contributed to the proceedings of the Sixty-fourth Annual Session of the American Medical Association in 1913. Two years later Dr. Douglass W. Montgomery read an important address on "Illustrations of the History of Leprosy," in the section on dermatology, of the American Medical Association, San Francisco, 1915, and many of those present were given the privilege of observing actual cases of leprosy, brought down to the meeting from the Isolation Hospital of the city. The paper by Dr. Montgomery was increased in value by a report of cases with observations on "Symptoms and Diagnosis of Leprosy," by Dr. Howard Morrow and Dr. A. W. Lee, of San Francisco, clearly illustrating that in its scientific aspects the disease is not being neglected in this country. Nor must I omit to refer by title to an address on "The Etiology and Treatment of Leprosy," by Dr. Ernest Dwight Chipman, read at the same meeting, which will always represent a milestone in the progress of the study of a subject which, on account of the rarity of the disease, is perhaps one of the most difficult problems of modern medicine.

MEDICAL AND DERMATOLOGICAL ASPECTS OF LEPROSY

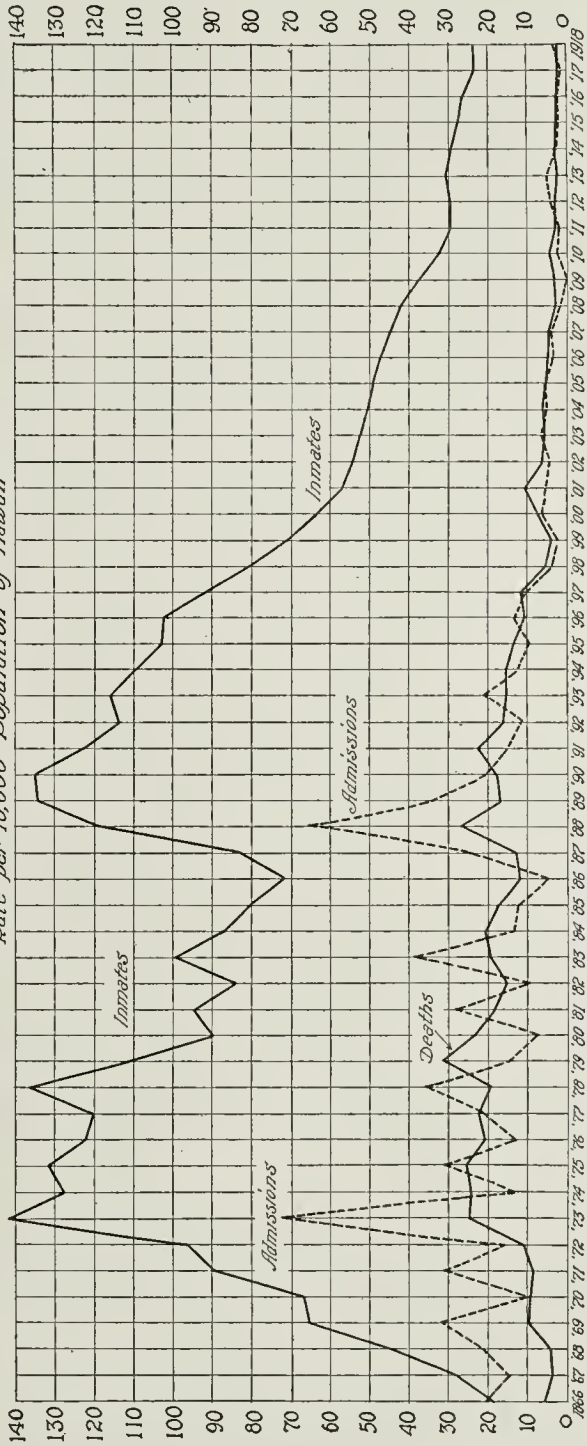
Regardless of the advances which have been made during recent years, we are still far behind in the adequate consideration of questions of etiology, diagnosis, and treatment based upon the actual experience which has been had in this country and which unquestionably, in important matters of detail, differs from the experience in large endemic leprosy centers abroad. This point of view is perhaps best illustrated by reference to the extremely interesting report on the treatment of leprosy, by Dr. F. Hall, superintendent of the leper asylum at Makogai, Fiji Islands, and the admirable statistical analysis of 10,000 cases of leprosy at the Culion Leper Colony, Philippine Islands, by Dr. Oswald E. Denney. This paper is of special interest if read in connection with the observations on the treatment of leprosy in the Philippine Islands, by Dr. Victor G. Heiser,

Leprosy in Hawaii

Lepers by Race and Sex, ~ Molokai, June 30, 1918



Admissions, Inmates and Deaths of Lepers, Molokai, 1866-1918



formerly the director of health and a surgeon of the United States Public Health Service (1914). The scientific study of the subject would be very much enhanced if more detailed reports were made of the cases under observation throughout the country, but particularly in the larger centers like Louisiana, Massachusetts, California, and Molokai. The best illustrations of the proper method of reporting on existing cases are the annual reports on leprosy in New South Wales, including an annual review with observations of all cases at the colony at Little Bay since 1883. Such a tabular analysis for Hawaii would make an extremely interesting contribution to knowledge and possibly aid in the solution of a problem which thus far has failed to meet the exacting requirements of modern scientific research. The New South Wales reports give the name (by initials), the sex, nativity, occupation, date of, and age on admission, locality where disease was probably contracted, number of the case, clinical notes, and the date of death or discharge. The clinical notes describe in detail, though with the required brevity, the history of the illness, the conditions on admission, differentiating the parts of the body, and finally, notes on the progress of the disease and the treatment, presenting in brief a reasonably complete picture of the cases under treatment, amplified by notes on the examinations of material for leprosy bacilli carried out by the microbiological laboratory of the department of public health.

PRESENT STATUS OF THE FEDERAL LEPROSARIUM

It would be utterly impossible to attempt, within the necessary limitations of time, the presentation of the essential facts of leprosy occurrence throughout the world, although an abundant amount of extremely valuable material is available for the purpose. The hope that the leprosy investigations at the United States station at Molokai would very materially increase our knowledge of the disease from its incipient to its advanced stage has not been realized. But even more lamentable is the long delay in the establishment of a federal leprosarium in accordance with the act of Congress of February 3, 1917, although it may be said that the outlook at the present time is somewhat more hopeful that such an institution will shortly be established, though possibly not in a locality entirely suitable for the purpose.

I am able to conclude this address with a letter from the Acting Surgeon General of the United States Public Health Service, dated March 10, 1920, who in answer to an inquiry as to the present status of the leprosarium question, replied as follows:

"In reply to your letter of March 5th requesting information as to the present status of the Federal Home for Lepers, I have the honor to inform you that the Board hopes to begin construction within a short time. As you know, the Surgeon General appointed a Board of which you were a member to assist in the selection of a site. This Board made a careful and comprehensive survey of all available sites in all sections of the United States and decided that the best and most suitable site for the Federal Leprosarium would be on the three islands known as Snake Key, North Key and Sea Horse Key, lying in the Gulf of Mexico off Cedar Keys, Florida. The Board

so recommended to the Surgeon General who approved their findings and forwarded them to the Secretary of the Treasury with a request that the transfer of these three islands be requested from the Department having jurisdiction. In accordance with the request of the Secretary of the Treasury the Secretary of War on September 5th transferred Snake Key and North Key for the purposes of a leprosarium disclaiming jurisdiction of Sea Horse Key which had been set apart for light house purposes on September 25, 1851, and was therefore under the jurisdiction of the Department of Commerce. A Department letter addressed to the Secretary of Commerce asking for permission to use and occupy Sea Horse Key for the proposed Federal Home for Lepers was favorably answered by the Secretary of Commerce on September 19, 1919.

"As might be expected the selection of a site for a leprosarium in any state would develop some opposition. The entire Florida delegation accompanied the Governor of Florida in a visit of protest to the Surgeon General on October 23rd, 1919. The opposition locally, however, is largely the development due to the activity of one man, and through a very active propaganda instituted by him throughout the state.

"Since that time Government representatives have been able to present the facts to the people of Florida and a very strong sentiment has developed for the establishment of the leprosarium on the site named above.

"Owing to the popular fallacy concerning the danger of leprosy it is not to be expected that less opposition will be encountered in any state and in all probabilities the Department will go ahead with the construction of the Federal Home for Lepers upon the three keys named in the vicinity of Cedar Keys, Florida."

IMPORTANCE OF ACCURATE AND COMPLETE LEPROSY STATISTICS

The question of leprosy increase and the adequate federal care and proper treatment of lepers is, therefore, one of the near future, being largely dependent upon an aroused public, professional and governmental interest. Leprosy at the present time may possibly have reached a more or less stationary condition in this country, but it is not to the credit of our civilization that the frequency of the disease should not be actually on the decrease. The apparent increase can not be charged exclusively to the foreign element, which can not if leprosy be kept out by even the most rigid quarantine examination, but, as shown by the experience in Louisiana, for at least one hundred years, the disease has gradually been gaining in frequency until a number of endemic centers now exist as to which the public at large is rightfully entitled to more trustworthy information than is at present available. According to the reports received from health officials all over the country, there are at present not less than eighty-seven cases in Louisiana, thirty-nine cases in California, thirteen cases at the Penikese Colony of the State of Massachusetts, twenty-eight cases in the city of New York, five cases in Connecticut, ten cases in Minnesota, and thirty-three cases in Texas. There are sufficient reasons for believing that the number of known cases probably represents less than one-half of the actual number of cases in this country at the present time, and, restating the estimate previously arrived at, which unquestionably falls short of the whole truth, the probable number of cases of leprosy in this country at the present time is not less than 400. The situation is therefore a most serious one, which it is the duty of the Government to consider with a lesser degree of indifference than has been the case in the past, and more so in view of the liberality of Congress in providing adequately for the establishment of one federal leprosarium, which it is hoped will in time

be followed by two or three others, as the only hope of dealing effectively with the question of proper segregation and control. It is the firm belief of those who are best in a position to judge, that only by means of such segregation can the frequency of the disease be reduced—at least this has been the experience at Tracadie in New Brunswick, at Bergen in Norway, and at Molokai in Hawaii. Nothing could be more wrongful than to arouse an unnecessary alarm on the part of the general public, for the actual danger of an extensive spread of the disease is slight, but whoever has seen even one case of leprosy, and I personally have seen more than two thousand, can not but feel a sense of profound personal obligation that nothing should be left undone so that this most unfortunate element of our population may be better cared for in a medical as well as in a humane sense, than is the case, unhappily, at the present time.

SUMMARY OF CONCLUSIONS

On the basis of the best possible information it may therefore be conservatively estimated that there are not less than 250 known cases, and probably from 400 to 500 known and suspected cases of leprosy throughout the continental United States at the present time.

This estimate is more conservative than earlier assumptions, but the available evidence would seem to justify the conclusion that the disease is very slowly increasing in this country and that new foci of leprosy are being formed and as such constitute a serious menace to the public health interests of the nation as large.

Under date of February 3, 1917, or more than three years ago, Congress enacted a bill providing the sum of \$250,000 for a federal leprosarium, chiefly for the care of interstate and international lepers. It is regrettable that there should have been so much delay in establishing a model federal institution, but the outlook seems fairly hopeful that the site selected at Cedar Keys, Florida, will meet with public approval. Whether it is the best site that could have been selected is open to question.

It was recommended that the Government use the Ship Island quarantine station, which has been abandoned for other purposes, and could have been utilized at very small expense practically for the immediate accommodation of isolated cases of leprosy throughout the South. The question is pertinent why such a site, in all respects admirable for the purpose, should go to waste when the situation is most urgent and in fact in some cases a desperate one.

The first leper home in this country was established by the State of Louisiana in 1894 near Carville, on the Yazoo and Mississippi Valley Railway, near a point in Iberville Parish, La., known as Bruns, about sixty miles from New Orleans. That institution has about one hundred inmates and is under the medical supervision of Dr. Ralph Hopkins, of New Orleans, and a board, of which Dr. Isadore Dyer is a member.

At the Louisiana institution about eighty per cent. of the lepers cared

for are white, whereas the white population of the State is only fifty-seven per cent. Whether this would justify the conclusion that leprosy is relatively more common among the white than among the colored population is somewhat doubtful, for negro cases are probably more effectively secreted than white cases.

The average age on admission was thirty-two years for white males and forty years for colored males. For females the average age on admission was thirty-seven years for white patients and thirty-eight years for colored patients. It would therefore seem fairly safe to conclude that the average age on admission is somewhat higher for colored lepers than for white lepers.

Of the total number of cases now under observation at the Louisiana Home, about thirty per cent. are of the tubercular variety, twenty-four per cent. of the anesthetic variety, and thirty-seven per cent. of the anesthetic and tubercular varieties combined.

The age period of greatest frequency on admission was 20-29 years.

The average length of treatment previous to death is from about eight to ten years. The duration varies with different types of the disease, being longest in anesthetic cases and shortest in tubercular cases.

For most of the elements of the leprosy problem the data are only gradually becoming available. In the report of the Senate Committee on Public Health and National Quarantine is included a large amount of international information, some of which has been brought down to date for the present purpose and is included in Appendix B to this address.

Unfortunately our information regarding leprosy in the States in which the disease is fairly common is far from complete. According to the most trustworthy recent returns the number of known cases of leprosy in Louisiana is eighty-seven; in California, thirty-nine; in Massachusetts, thirteen; in Minnesota, ten; in New York City, twenty-eight; in the State of Pennsylvania, six; in Texas, thirty-three; while isolated cases are known to occur in probably ten to fifteen more States at the present time.

In the registration area, which now includes about eighty per cent. of the total population of the United States, there have occurred during the last ten years 120 deaths from leprosy. The recorded mortality rate has increased from 0.13 per million in 1900 to 0.29 in 1918. If the death rate of 1918 is taken as 0.3 per million, the number of probable cases in the continental United States may be conservatively placed at 400. This does not represent the cases officially noted during the lifetime of all the lepers, or effectively segregated, or subject to government supervision and control, but rather the assumed number of cases which give rise to the mortality indicated on the basis of the probable known death rate of lepers under segregation, placed as high as 80 per 1,000 per annum.

The discussion includes a statement in detail of nearly 250 reported cases of leprosy throughout the continental United States during the period April, 1916, to April, 1920. The list clearly emphasizes the menace to the American nation of a deplorable attitude of public apathy and neglect.

It was the evidence presented to the Senate Committee on Public Health and National Quarantine which resulted in the passage of a bill providing for a federal leprosarium. One institution will meet an emergency but will only in part aid in the solution of the problem. Three institutions are certainly required, and possibly four; there should be one on the Gulf Coast, one on the Pacific, one on the Atlantic, and one in the Central West. The institutions now maintained by the State of Massachusetts at Penikese Island, Buzzard's Bay, by the State of Louisiana, by the City of San Francisco at the Isolation Hospital, and by certain other communities in connection with public institutions, meet only the most urgent needs of a situation not far from desperate. It is to be hoped that the Public Health Service will more actively concern itself in the future with the provision of the act of Congress, which, though not mandatory, is certainly equivalent to a request that all unnecessary delay should be avoided.

There is leprosy to the north of us in New Brunswick and British Columbia; there is leprosy to the south of us in the West Indies and Central America, the Panama Canal Zone, and throughout a large portion of South America; there is leprosy to the east of us in European countries such as Greece, Bulgaria, Syria, Scandinavia, Northeast Germany, Russia, Turkey, etc.; and there is leprosy on an immense scale to the west of us in Hawaii, the Philippines, Japan, and throughout the farther East. Only a grossly indifferent public opinion can account for our national apathy towards a question which has been a subject for discussion in the medical press and otherwise for over fifty years. There are perhaps one hundred cases in the Panama Canal Zone, there are over six hundred cases in Hawaii, there are over five thousand cases in the Philippines, and throughout the world possibly not less than three million cases, a potential menace at least to every other country indifferent to its interest and in our own case from the fact that leprosy in the United States occurs often in isolated instances, one and all of which can be traced to some locality where leprosy is known to exist.

It may therefore be suggested that this question should receive more adequate consideration in the future and that pressure should be brought to bear upon the public health authorities, the Federal Government, and the several States to deal more effectively and humanely with leprosy cases now known to occur. It may further be suggested that the time is opportune for another leprosy conference in continuation of the international meetings held in Berlin in 1897 and in Bergen, Norway, in 1909, and of the corresponding national conference held in the Argentine Republic in 1906.* Such a conference would bring together the best thought of the present period in behalf of the solution of a problem which is an indictment of our civilization and most of all of our indifference to the humane interests and the personal welfare of the most afflicted portion of mankind.

*For important observations on previous leprosy congresses see the Journal of the American Medical Association, April 4, 1896, February 20, 1897, and November 13, 1897. Also the report by Sir Arthur Newsholme and Sir Malcolm Morris at the International Conference of 1909. (Parliamentary paper, Cd. 4916, London, 1909, P. S. King & Son, London.)

APPENDIX A

LEPROSY IN INDIA

There is no more fruitful field for the statistical study of leprosy than the vast Indian Empire, for which admirable census reports have been published for a long period of time. These reports amplify the large amount of useful information contained in the report of the Leprosy Commission (Calcutta, 1893). According to the census of India for 1911 (Calcutta, 1913) the proportion of lepers to population was 50 males and 18 females per 100,000 of each sex. Of the different provinces of India, Assam suffers most, then Burma, then, in order, Bihar and Orissa, the Central provinces and Berar, Madras, Bengal, Bombay, the United provinces, the Punjab, and the Northwest Frontier provinces. In the last two provinces the proportion of lepers was 17 males and 8 females per 100,000 of population of each sex. It is observed in the report referred to that "the physical and climatic characteristics of the tracts where leprosy is most prevalent differ greatly. In some of these tracts the climate is dry and the rainfall light, while others have a damp climate with heavy rainfall. Some of them are alluvial river valleys, while others have a laterite or rocky soil. Some are low-lying, others are slightly elevated, and others again are in mountainous country. The races who inhabit these areas also vary greatly, and they subsist on different kinds of food."

Throughout India the ratio of male lepers is far in excess of the corresponding ratio of females. It is pointed out, however, that while it is possible that males are more susceptible to the disease than females, it is very improbable that this is the case to the extent indicated by the census figures. For it is held that "the great disproportion which they show is no doubt due largely to the fact that the disease is concealed wherever possible, and that women are more successful than men in evading the inquisitiveness of the enumerators." As regards the incidence of age, it is stated that "under the age of 10 the proportion of lepers is exceedingly small, but it soon begins to grow. There is a considerable increase between 10 and 20; and from that age up to 50 the rise is uniform and fairly rapid. Between 50 and 60 the proportion continues to increase slightly, and then declines. Bearing in mind the fact that a leper's life is a comparatively short one, it would seem that the greatest liability to the disease occurs between the ages 20 and 50."

The occurrence of leprosy according to caste is an extremely complex problem which cannot be dealt with briefly on account of the (to us) practically meaningless designations of castes for which there is no equivalent in English-speaking countries. Those who care to examine into the subject from this viewpoint should consult the handbooks for the Indian army describ-

ing the different principal castes in India, published by the government printing office, Calcutta. It is stated in the census report for 1911 that "the low castes suffer more from leprosy than the high." This greater liability, it is explained, of the lower castes, "may be ascribed to their poverty, and to the small, insanitary, and often dirty, houses in which they live." But it is pointed out in this connection, "it must be remembered that successful attempts at concealment are probably more frequent in the case of the higher castes. The proportion of Christians among lepers is exceptionally high, but this is simply because most of the asylums are managed by missionary bodies, who make many converts amongst the unfortunate inmates."

The number of lepers throughout India has decreased from 126,000 in 1891 to 109,000 in 1911, a diminution equivalent to more than 13 per cent. This decrease, it is maintained, is genuine and indicative of a real diminution in the prevalence of the disease. It is pointed out, however, that this is "partly the result of the improved material condition of the lower castes, amongst whom leprosy is most common, and of a higher standard of cleanliness."

The total number of leper settlements or asylums in India, according to the census of 1911, was then 73. But these contained only some 5,000 inmates, or not quite five per cent. of the total number of lepers. The report concludes with the following interesting observation:

"The belief is growing that leprosy is communicated from one human being to another by some insect, and two South African doctors have recently published papers implicating the bed bug (*acanthia lectularia*). If this theory be correct it is obvious that the segregation of lepers in asylums must reduce the number of foci of the disease, and to that extent prevent it from spreading. It is worthy of note that in many of the districts where the disease was most prevalent in 1891, there has since been a remarkable improvement. Chamba, which in 1891 had 34 lepers in every ten thousand of its population, now has only 15; in Birbhum the corresponding proportion has fallen from 36 to 16, in Bankura from 36 to 23, in Simla from 29 to 18, in Dehra Dun from 20 to 11, in Garhwal from 17 to 10, in Burdwan from 22 to 14, and in North Arakan from 28 to 20."

These general observations on the occurrence of leprosy throughout India are enlarged upon in the separate census reports for the several provinces.

Referring first to the province of Assam (Shillong, 1912), it appears that the local rate of incidence varies between a minimum of less than 5 per 100,000 of population to a maximum of from 85 to 90. The report directs attention to the marked decline in the relative frequency of the disease, but it is not clear whether the decrease is equivalent to an actual diminution or to an improvement in the more correct diagnosis. It is said, for illustration, that the general results of the caste statistics point to the conclusion that the high proportional figures for Assam are due in a great measure to the confusion of leprosy with other corrosive or skin diseases. Of interest in this connection is a statement that "once a person is attacked

with leprosy, his expectation of life is considerably diminished, the average period after the appearance of the disease being from 10 to 18 years."

The report for Burma (Rangoon, 1912) shows an increase in the frequency of the disease, the number of lepers in 1911 being 4,842 males and 2,196 females, or, respectively, 40 and 18 per 100,000 of population. The author of the report, Mr. C. Morgan Webb, directs attention to the interesting fact that there is an exceptionally low proportion of leprosy in the five sea-coast districts, and states that "this would appear to effectively dispose of the theory of Dr. Hutchinson that leprosy is caused by a bacillus introduced into the stomach by means of badly cured fish, eaten in a state of partial decomposition and not sufficiently cooked." It is explained in this connection that "the comparative absence of leprosy in coast districts would appear to be a stronger argument against the theory, than its presence in regions remote from seas and rivers. However the theory has not yet succeeded in receiving general acceptance. Apart from the comparative immunity of the coast districts from leprosy no rule for its general distribution by locality can be formulated. It cannot be said to be more prevalent in wet districts than in dry districts or *vice versa*, nor does the contour of the country or the diversity of its surface appear to have any appreciable effect on the prevalence of this infirmity."

In addition to the foregoing, however, the report directs attention to the high degree of prevalence of leprosy among the Inthas, a tribe of lake dwellers of Burmese race, which seems to support the theory of Dr. Hutchinson that leprosy is caused by the consumption of badly cooked and badly cured fish. The views of Sir Jonathan Hutchinson have been set forth in a treatise entitled "On Leprosy and Fish Eating," (London, 1906) which contains a number of very suggestive references to Burma and the Burmese type of leprosy (p. 350 *et seq.*).

Aside from much other interesting information, the report restates the conclusions of the British and Colonial delegates to the International Conference on Leprosy held at Bergen, Norway, in 1909, as follows:

"(1) Leprosy is spread by direct and indirect contagion from persons suffering from the disease. The possibility that indirect contagion may be effected by fleas, bugs, lice, the itch, etc., has to be borne in mind. Leprosy is most prevalent under conditions of personal and domestic uncleanness and overcrowding, especially where there is close and protracted association between the leprous and non-leprous.

"(2) Leprosy is not due to the eating of any particular food, such as fish.

"(3) There is no evidence that leprosy is hereditary; the occurrence of several cases in a single family is due to contagion.

"(4) In leprosy an interval of years may elapse between infection and the first recognised appearance of the disease. It is a disease of long duration, though some of its symptoms may be quiescent for a considerable period and then recur.

"(5) The danger of infection from leprous persons is greater when there is discharge from mucous membranes or from ulcerated surfaces.

"(6) Compulsory notification of every case of leprosy should be enforced.

"(7) The most important administrative measure is to separate the leprous from the non-leprous by segregation in settlements or asylums.

“(8) In settlements, home life may be permitted under regulation by the responsible authorities.

“(9) The preceding recommendations, if carried out, will provide the most efficient means of mitigating the leper's suffering and of assisting in his recovery, and at the same time will produce a reduction and ultimate extinction of the disease.” (pp. 234-5.)

In the provinces of Bengal, Bihar and Orissa leprosy is unusually prevalent in two well-defined centers, which contain some 12,600 enumerated cases. The average rate is as high as 160 per 100,000 of population, and reaches a maximum intensity in the Bankura district, with a rate of 230. Since 1901 there has been a general decline of leprosy throughout the provinces, or for males from 72 to 62 and for females from 23 to 21 per 100,000 of population. The decrease is in part ascribed to a more accurate diagnosis of leprosy and particularly to such complaints as leucoderma and secondary syphilis, which are excluded from the returns. It, however, is held that there is no question of doubt that leprosy is gradually though slowly, becoming less common.

Recalling the previous statement that a leper's life is a comparatively short one, the observation is of interest that “according to one of the most reliable estimates, the average duration of life from the date of attack is only nine and one-half years for tuberculated and eighteen and one-half years for anesthetic leprosy.”

Reference is made to the Lepers' act of 1898, applicable to the whole of India, which provides for the establishment of asylums to which lepers may be sent from specified areas and for the arrest of pauper lepers found wandering in such areas, and for their detention in an asylum. It also empowers the local government to prohibit lepers from engaging in certain trades or occupations likely to endanger the public health.

Referring to the views of Sir Jonathan Hutchinson, as regards causation of leprosy among fish eating races, it is pointed out in the report that:

“Mr. Hutchinson's theory is not confirmed by the results of the census over the areas where leprosy is most prevalent. In Bankura, in particular, which is the worst leper centre in either Province, the consumption of badly cooked fish is extremely rare. On the other hand, it is common among the Nepalese races, who fulfil the conditions necessary according to Mr. Hutchinson, for (1) the fish they eat is badly cured, (2) it is eaten very largely, (3) it is in a state of partial decomposition and (4) it is imported from distant places. In every bazar frequented by the Nepalese such badly cured fish may be seen. Its condition will be sufficiently described by a quotation from Mr. Inglis an old planter of North Bihar. Large quantities of dried fish are sent to Nepal, and exchanged for rice and other grains, or horns, hides and blankets. The fish-drying is done very simply in the sun. It is generally left till it is half putrid and taints the air for miles. The sweltering, half-rotting mass, packed in filthy bags, and slung on ponies or bullocks, is sent over the frontier to some village bazar in Nepal. The track of a consignment of this horrible filth can be recognized from very far away. The perfume hovers on the road, and as you are riding up and get the first sniff of the putrid odour, you know at once that the Nepalese market is being recruited by a fresh accession of very stale fish. If the taste is at all equal to the smell, the rankest witches' broth ever brewed in a reeking cauldron would be preferable. The localities where the Nepalese are found in greatest strength have little leprosy, viz., Darjeeling, where the propor-

tion of male lepers per 100,000 is 45, and, Sikkim, where it falls to 16. The figures for Nepalese castes, however, show that the incidence of leprosy is very low; out of 35,000 persons belonging to different Nepalese castes in Sikkim only six are lepers."

In the Central provinces and Berar the local variation in leprosy incidence is very considerable, the average being as high as 46 per 100,000 of population. The total number of lepers in the two provinces is 7,307. It is pointed out that women seem to be attacked by the disease at an earlier age than men, and that the higher ratio of male lepers is in part accounted for by the more successful concealment of female cases, as well as by the apparently higher mortality "among leprous women who will not so readily solicit charity as men by displaying the disease in public."

For Madras the local census report is unfortunately not available, nor for the province of Bombay. For the United provinces of Agra and Oudh (Allahabad, 1912) the report prepared by E. A. H. Blunt, I.C.S., contains a considerable amount of extremely interesting and suggestive data indicating also a wide variation in local incidence, from a minimum rate of less than 10 per 100,000 to a maximum of over 100. The total number of lepers in 1911, including native states, was about 14,500, which compares with not quite 12,000 in 1901. The increase is equivalent to about 24 per cent. The Himalayan division has incomparably the largest number of lepers, although there is a decrease both amongst males and females, and the figures are obscured by the presence of several asylums. In marked contrast to previous observations, in this report the view is advanced that "since the life of a leper seldom exceeds twenty years, it is obvious that a very large part of any increase must be due to fresh cases." Unless the majority of cases are of the anesthetic type, it is doubtful whether the average after-lifetime of a leper would exceed twelve years. It is observed that "leprosy has at all times proved a medical puzzle; despite all the attention it has received, its causation is still unknown and a cure is unknown." This statement might easily mislead those who are not aware of the fact that the causative factor, or bacillus *lepra* has been thoroughly identified and is easily recognized, although the form of transmission or spread of the disease still remains shrouded in mystery. Reference is made to the Lepers' act of 1898, which contains a provision that "lepers may be forbidden to follow callings connected with the preparation and sale of food, drink, drugs, tobacco and clothing, domestic service, medical practice, midwifery, washing clothes, hair cutting, shaving, or callings which necessitate the handling of food and drink: and also to bathe, wash clothes in, or take water from, certain wells or tanks or use any public carriage save a railway carriage." Finally, it is pointed out in the report that "the great majority of lepers are not and cannot be segregated." Since the total number of lepers in British territory was 14,143 in 1911, aside from 377 lepers in native states, the importance of this conclusion is obvious.

The Census Report of the Northwest Frontier province (Peshawar, 1912), prepared by C. Latimer, I.C.S., also calls attention to the diminution of the disease from an actual number of 294 cases in 1901 to 282 in 1911. Attention is directed to the excessive frequency of the disease in the hill districts and to the incidence of leprosy in the province of Kashmir, which for 1901 experienced a rate of 72 per 100,000 for males and 36 for females. It is observed in this connection that "whether this result is to be regarded as connecting leprosy with syphilis, which is known to be common in the hills, or whether the variation is due to difference in the food eaten, it is impossible to say," for "the causes which predispose to the disease do not seem to have been accurately determined; and no correspondence could be traced between the physical and climatic characteristics, or between the race and staple diet of their inhabitants."

For the native state of Travancore, the census report for 1911, prepared by N. Subramhanya Aiyar (Trivandrum, 1912), the local frequency is given as 49 male lepers per 100,000 of population, and 16 females. Since 1901 "there has been a perceptible decrease in the number of lepers, the decline amounting to 21 per cent." Attention is directed to the sudden increase in leprosy during the age period 10-20, when apparently the risk of infection is greatest.

In the native state of Coorg, the report for 1911, prepared by J. Chartres Molony, I.C.S. (Madras, 1912), contains no extended observations on the subject of leprosy, but the statistical results show a very marked decline in relative frequency, or, for the male population from 25 per 100,000 in 1881 to 6 in 1911, while for females the rate has declined from 23 in 1881 to 4 in 1901, no rate being given for the last census year.

Finally, in the native state of Baroda, according to the administration report, 1917-1918, the number of lepers treated at the asylum was 160 against 169 in 1916-17, but such figures are, however, not very trustworthy as an index of a possible diminution or increase in frequency, as is made evident by the statement that 71 patients absconded during the year under review, the question now being under consideration to wall in the asylum to increase the difficulty of escapes.*

*On the proposed establishment of more and model leper farm colonies in India see the *British Medical Journal*, of December 20, 1919.

APPENDIX B

LEPROSY STATISTICS

TABLE I

ANALYSIS OF LEPER ADMISSIONS TO THE LOUISIANA LEPER HOME

Rates per 1,000,000 Population

Calendar Year	Louisiana Population	New Cases Admitted each year (z)		Deaths		Remaining (x)	
		No.	Rate	No.	Rate	No.	Rate
1894	1,223,801	8	6.5	—	—	—	—
1895	1,250,105	18	14.4	4	3.2	—	—
1896	1,276,409	3	2.4	3	2.4	22	17.2
1897	1,302,713	6	4.6	4	3.1	—	—
1898	1,329,017	5	3.8	1	—	23	17.3
1899	1,355,321	2	1.5	3	2.2	—	—
1900	1,381,625	7	5.1	6	4.3	30	21.7
1901	1,409,101	10	7.1	5	3.5	—	—
1902	1,436,577	10	7.0	7	4.9	38	26.5
1903	1,464,053	7	4.8	9	6.1	—	—
1904	1,491,529	13	8.7	2	1.3	38	25.5
1905	1,519,005	10	6.6	2	1.3	—	—
1906	1,546,481	11	7.1	3	1.9	47	30.4
1907	1,573,957	8	5.1	1	0.6	—	—
1908	1,601,434	8	5.0	1	0.6	47	29.3
1909	1,628,911	18	11.1	7	4.3	—	—
1910	1,656,388	17	10.3	3	1.8	66	39.8
1911	1,683,864	15	8.9	7	4.2	—	—
1912	1,711,340	12	7.0	4	2.3	74	43.2
1913	1,738,816	27	15.5	8	4.6	—	—
1914	1,773,482	22	12.4	5	2.8	87	49.1
1915	1,801,306	23	12.8	9	5.0	—	—
1916	1,829,130	22	12.0	16	8.7	103	56.3
1917	1,856,954	9	4.8	4	2.2	—	—
1918	1,884,778	15	8.0	4	2.1	89	47.2
1919	1,912,602	16	8.4	5	2.6	91	47.6
1920	1,940,426	—	—	—	—	87	44.8

(z) Actual count of cases.

(x) Remaining at time Report is made in April.

Data from Biennial Reports of the Board of Control. (Incomplete records.)

TABLE II

ANALYSIS OF ADMISSIONS TO LEPER HOME, LA.

For the Period December 1, 1894, to December 31, 1915

Age on Admission	Males Cases	Females Cases	Males and Females, Cases
-10	4	1	5
10-14	16	8	24
15-19	21	11	32
20-29	34	15	49
30-39	28	12	40
40-49	22	16	38
50-59	25	14	39
60-69	7	8	15
70 and Over	4	4	8
Unknown	5	2	7
All Ages	166	91	257
Average Age on Admission	33.8	37.3	35.0

Data from Biennial Reports of the Board of Control for the Leper Home.

TABLE III
LEPERS AT ISOLATION HOSPITAL, SAN FRANCISCO, CALIFORNIA
Rates per 1,000,000 of Population

Year Ending June 30	Population	Admissions		Deaths		Remaining	
		No.	Rate	No.	Rate	No.	Rate
1900	342,782	1	2.9	2	5.8	19	55.4
1901	350,195	5	14.3	2	5.7	21	60.0
1902	357,608	9	25.2	1	2.8	27	75.5
1903	365,021	3	8.2	1	2.7	26	71.2
1904	372,434	3	8.1	3	8.1	19	51.0
1905	379,847	—	—	4	10.5	15	39.5
1906	387,260	4	10.3	3	7.7	20	51.6
1907	394,673	—	—	4	10.1	15	38.0
1908	402,086	4	9.9	—	—	17	42.3
1909	409,499	3	7.3	3	7.3	16	39.1
1910	416,912	5	12.0	3	7.2	17	40.8
1911	424,325	2	4.7	—	—	18	42.4
1912	431,738	5	11.6	2	4.6	18	41.7
1913	439,151	5	11.4	3	6.8	16	36.4
1914	446,564	4	9.0	3	6.7	14	31.4
1915	453,977	1	2.2	1	2.2	15	33.0
1916	461,390	1	2.2	2	4.3	20	43.3
1917	468,803	13	27.7	3	6.4	17	36.3
1918	476,216	7	14.7	5	10.5	19	39.9
1919	483,629	1	2.1	1	2.1	20	41.4

Data from the Reports of the Department of Public Health, San Francisco, Calif.

TABLE IV
LEPROSY IN MASSACHUSETTS, PENIKESE (ISLAND) HOSPITAL*
Rates per 1,000,000 Population

Year Ending November 30	Population	Admitted		Died		Remaining	
		No.	Rate	No.	Rate	No.	Rate
1905	3,003,680	5	1.7	—	—	5	1.7
1906	3,076,224	—	—	—	—	5	1.6
1907	3,148,768	4	1.3	1	0.3	8	2.5
1908	3,221,312	1	0.3	—	—	8	2.5
1909	3,293,856	3	0.9	—	—	10	3.0
1910	3,366,416	1	0.3	—	—	11	3.3
1911	3,431,792	2	0.6	—	—	13	3.8
1912	3,497,168	4	1.1	1	0.3	15	4.3
1913	3,562,544	2	0.6	1	0.3	15	4.2
1914	3,627,920	—	—	1	0.3	13	3.6
1915	3,693,310	1	0.3	3	0.8	11	3.0
1916	3,758,688	2	0.5	4	1.1	9	2.4
1917	3,824,067	3	0.8	1	0.3	11	2.9
1918	3,889,446	2	0.5	—	—	12	3.1
1919	3,954,825	2	0.5	—	—	13	3.3

Data from the Reports of the State Board of Charities of Massachusetts.

*Of the 29 lepers apprehended in the state of Massachusetts during the period 1882-1915, the distribution by types of disease was as follows: Tubercular 22, or 75.9 per cent.; anesthetic 4, or 13.8 per cent.; mixed 2, or 6.9 per cent.; unknown 1, or 3.4 per cent. Of the total number of admissions 23 were males and 6 were females; of the latter, 4 were of the tubercular type.

Of the 23 male cases apprehended, 9, or 39.1 per cent., died during the period under review; or, if the tubercular cases are separately considered, out of 18 cases, 7 died, or 38.9 per cent. Of the 6 female cases, 2 died, or 33.3 per cent. Of the 29 cases, 10, or 34.1 per cent., were of the age period 20-29, which may be considered the age period most liable to infection. Of the 29 cases only 4 were natives of the United States, and of these, two were born in the Hawaiian Islands, 1 in a foreign country and only 1 in the state of Louisiana. The remainder had come to this country from the Azores, Cape Verde, British West Indies, China, Greece, Italy, Japan, Russia, Sweden and Syria.

TABLE V
LEPROSY IN THE UNITED STATES REGISTRATION AREA

Year	Population	Deaths	Rate per Million
1900	30,794,273	4	0.13
1901	31,370,952	6	0.19
1902	32,029,815	5	0.16
1903	32,701,083	4	0.12
1904	33,349,139	4	0.12
1905	34,094,605	8	0.23
1906	41,983,419	3	0.07
1907	43,016,990	7	0.16
1908	46,789,913	11	0.24
1909	50,870,518	9	0.18
1910	53,843,896	10	0.19
1911	59,275,977	7	0.12
1912	60,427,133	11	0.18
1913	63,299,164	6	0.09
1914	65,989,295	12	0.18
1915	67,336,992	13	0.19
1916	71,621,632	11	0.15
1917	75,527,486	17	0.23
1918	81,868,104	24	0.29

TABLE VI
DEATHS FROM LEPROSY IN THE UNITED STATES REGISTRATION AREA
BY STATES, 1907-1918

STATES	YEARS												Total
	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	
California	3	5	3	2	4	3	—	3	3	—	6	5	37
Connecticut	—	—	—	—	—	—	1	—	—	—	—	—	1
Florida	—	2	—	1	—	—	—	2	1	1	1	1	9
Indiana	—	—	—	—	—	1	—	—	—	—	—	1	2
Louisiana*	1	2	—	2	—	—	—	—	1	—	—	11	17
Massachusetts	1	—	—	—	—	1	1	1	3	4	1	—	12
Michigan	—	—	—	—	—	2	—	—	2	—	—	—	4
Minnesota	—	—	—	1	2	—	1	—	1	1	—	—	7
New Jersey	—	—	—	—	—	—	—	—	—	—	1	—	1
New York	1	—	2	1	1	1	1	2	—	4	4	2	19
Ohio	—	1	—	—	—	—	—	—	—	—	—	—	1
Pennsylvania	—	1	—	—	—	—	—	1	—	—	—	3	5
Rhode Island	—	—	—	—	—	—	—	—	1	—	—	—	1
South Carolina	—	—	—	2	—	—	—	2	—	1	1	1	7
Texas	1	—	—	—	—	—	2	1	1	—	2	—	7
Washington	—	—	—	—	—	—	—	—	—	—	1	—	1
Wisconsin	—	—	—	1	—	—	—	—	—	—	—	—	1
Registration cities in other States	—	—	4	—	—	3	—	—	—	—	—	—	7
													139

*For years previous to 1918, data for New Orleans only.

TABLE VII
MORTALITY FROM LEPROSY IN CUBA, 1903-1914

Year	Population	Deaths from Leprosy	Rate per Million
1902	1,751,366	17	9.7
1903	1,810,889	31	17.1
1904	1,870,412	17	9.1
1905	1,929,935	29	15.0
1906	1,989,458	39	19.6
1907	2,048,980	47	22.9
1908	2,082,691	30	14.4
1909	2,116,402	25	11.8
1910	2,150,112	35	16.3
1911	2,183,823	53	24.3
1912	2,217,534	37	16.7
1913	2,251,245	43	19.1
1914	2,284,956	45	19.7

Source: Sanidad y Beneficencia, Boletín Oficial de la Secretaría, Habana.

TABLE VIII
LEPROSY IN CUBA

Year	Population	Reported Cases Remaining at End of Each Year	Rate per Million of Population
1909	2,116,402	321	151.7
1910	2,150,112	343	159.5
1911	2,183,823	350	160.3
1912	2,217,534	338	152.4
1913	2,251,245	341	151.5
1914	2,284,956	351	153.6

Data from Sanidad y Beneficencia, Boletín Oficial de la Secretaría, Habana.

TABLE IX
STATISTICS OF THE LEPER COLONY, GOAT ISLAND, SAN JUAN, PORTO RICO,
1905-1919

Year	Population of Porto Rico	Inmates on June 30	Rate Per Million of Population
1905	1,042,342	18	17.3
1906	1,058,134	25	23.6
1907	1,073,926	25	23.3
1908	1,089,718	19	17.4
1909	1,105,510	24	21.7
1910	1,121,302	25	22.3
1911	1,137,094	25	22.0
1912	1,152,886	28	24.3
1913	1,168,678	28	24.0
1914	1,184,470	36	30.4
1915	1,200,262	39	32.5
1916	1,216,054	—	—
1917	1,231,846	—	—
1918	1,247,638	39	31.3
1919	1,263,430	39	30.9

Source: Annual Reports of the Governor of Porto Rico to the Secretary of War.

TABLE X

LEPROSY IN PANAMA CANAL ZONE, PALO SECO LEPER ASYLUM
Rates per 1,000,000 Population of Panama Canal Zone and Cities of
Colon and Panama

Year	Population	Admissions		Deaths		Remaining	
		No.	Rate	No.	Rate	No.	Rate
1907	102,133	—	—	1	9.8	14	137.1
1908	120,097	14	116.6	—	—	22	183.2
1909	135,180	24	177.5	1	7.4	34	251.5
1910	151,591	15	99.0	3	19.8	36	237.5
1911	156,936	24	152.9	2	12.7	49	312.2
1912	146,510	12	81.9	7	47.8	48	327.6
1913	129,104	15	116.2	9	69.7	45	348.6
1914	123,592	14	113.3	6	48.5	50	404.6
1915	121,650	11	90.4	2	16.4	58	476.8
1916	116,918	21	179.6	9	77.0	66	564.5
1917	(x) 114,003	11	96.5	7	61.4	67	587.7
1918	(x) 109,737	21	191.4	8	72.9	76	692.6

(x) Excluding the military for last six months of 1917 and the whole of 1918.

Data from Reports of the Health Department of the Panama Canal.

TABLE XI

LEPROSY IN PANAMA CANAL ZONE, PALO SECO LEPER ASYLUM
Number of Deaths of Lepers from 1907-1915

Type of Disease on Admission	Males Number	Females Number	Males and Females Number
Tubercular	18	6	34
Anesthetic	3	2	5
Mixed	3	1	4
Total	24	9	33

Nativity on Admission

Nativity	Number		Number	Females Black	Number	
	White	Males Black	White		Males and Females White	Black
United States	2	—	—	—	2	—
Spain	1	—	—	—	1	—
Panama	—	6	—	7	—	13
Colombia	—	2	—	1	—	3
Costa Rica	—	1	—	—	—	1
Jamaica	—	5	—	1	—	6
Barbados	—	4	—	—	—	4
Antigua	—	1	—	—	—	1
China	—	1	—	—	—	1
Peru	—	1	—	—	—	1
Total	3	21	—	9	3	30

Source: From data received from Palo Seco Leper Asylum.

Note:—The average duration of the disease has been 7.5 years; or, roughly, 6.8 years for tubercular cases, 8.8 years for anesthetic cases, and 9.8 years for mixed cases. For ages under 15 the average duration was 6.3 years, for ages 15 to 44 it was 6.8 years, and for ages 45 and over, 9.7 years.

TABLE XII
MORTALITY FROM LEPROSY IN THE CITY OF RIO DE JANEIRO, 1890-1918

Year	Population	Deaths	Rate per Million
1890	429,848	9	20.9
1891	440,118	13	29.5
1892	450,636	14	31.1
1893	461,411	20	43.3
1894	472,454	18	38.1
1895	483,773	18	37.2
1896	495,380	19	38.4
1897	507,286	18	35.5
1898	519,503	13	25.0
1899	532,042	22	41.4
1900	544,917	10	18.4
1901	558,140	16	28.7
1902	571,728	19	33.2
1903	585,695	20	34.1
1904	600,067	23	38.3
1905	614,831	25	40.7
1906	625,756	22	35.2
1907	636,018	34	53.5
1908	637,089	20	31.4
1909	649,362	14	21.6
1910	669,781	11	16.4
1911	708,669	29	40.9
1912	749,376	25	33.4
1913	754,839	16	21.2
1914	738,950	27	36.5
1915	737,888	21	28.5
1916	719,316	19	26.4
1917	696,284	21	30.2
1918	700,443	23	32.8

Source: Anuario de Estatistica Demographo-Sanitaria de Rio de Janeiro, and Boletim Mensal de Estatistica Demographo-Sanitaria.

TABLE XIII
MORTALITY FROM LEPROSY, CITY OF SAO PAULO, BRAZIL, 1901-1917

Year	Population	No. of Deaths	Rate per Million
1901	286,000	5	17.5
1902	293,200	10	34.1
1903	300,400	4	13.3
1904	307,600	6	19.5
1905	314,800	7	22.2
1906	322,000	17	52.8
1907	329,200	11	33.4
1908	336,400	11	32.7
1909	343,600	6	17.5
1910	350,800	23	65.6
1911	358,000	21	58.7
1912	400,000	24	60.0
1913	480,000	19	39.6
1914	485,000	21	43.3
1915	500,000	23	46.0
1916	484,901	32	66.0
1917	452,028	26	57.5

Data from Anuario Demographico, Seccao de Estatistica Demographo-Sanitaria de Sao Paulo.

Anuario de Estatistica Demographo-Sanitaria de Rio de Janeiro.

Boletim Hebdomadario de Estatistica Demographo-Sanitaria de Sao Paulo.

TABLE XIV
DEATHS FROM LEPROSY IN THE FEDERAL DISTRICT OF
RIO DE JANEIRO, BRAZIL
By Sex and Age
1909-1918

Ages at Death	MALES			FEMALES		
	Population	Deaths	Rate per Million	Population	Deaths	Rate per Million
Under 19	2,115,954	6	2.8	1,822,555	5	2.7
20-29	1,247,036	23	18.4	790,822	9	11.4
30-39	885,174	27	30.5	569,392	15	26.3
40-49	591,560	38	64.2	389,735	13	33.4
50-59	293,614	30	102.2	226,700	14	61.8
60-69	120,805	19	157.3	118,012	10	84.7
70 and Over	47,131	5	106.1	64,077	9	140.5
All Ages	5,301,274	148	27.9	3,981,293	75	18.8

Data from Anuario de Estatistica Demographo-Sanitaria de Rio de Janeiro.

TABLE XV
MORTALITY FROM LEPROSY IN THE FEDERAL DISTRICT OF
RIO DE JANEIRO, BRAZIL
By Sex and Nativity
1909-1918

Nativity	MALES			FEMALES		
	Population	Deaths	Rate per Million	Population	Deaths	Rate per Million
Brazilian	3,575,179	97	27.1	3,298,899	64	19.4
Portugese	1,164,160	33	28.4	361,900	6	16.6
Italian	196,147	7	35.7	96,347	1	10.4
Spanish	161,159	5	31.0	75,246	1	13.3
Other European	66,266	4	60.4	54,146	1	18.5
Turko-Arabie	21,735	2	92.0	10,749	1	93.0
All Other	116,628	—	—	84,006	1	11.9
All Nativities	5,301,274	148	27.9	3,981,293	75	18.8

Data from Anuario de Estatistica Demographo-Sanitaria de Rio de Janeiro.

TABLE XVI
MORTALITY FROM LEPROSY, CITY OF RECIFE (PERNAMBUCO), BRAZIL
1907-1920

Year	Population	No. of Deaths	Rate per Million
1907	159,480	18	112.9
1908	166,110	19	114.4
1909	172,740	12	69.5
1910	179,370	12	66.9
1911	186,000	3	16.1
1912	210,000	10	47.6
1913	230,000	10	43.5
1914	232,500	6	25.8
1915	235,000	8	34.0
1916	237,500	8	33.7
1917	240,000	9	37.5

Data from Anuario de Estatistica Demographo-Sanitaria de Rio de Janeiro.
Boletim Mensal de Estatistica Demographo-Sanitaria do Municipio do Recife.

TABLE XVII
DEATHS FROM LEPROSY AND NUMBER OF INMATES IN LEPER ASYLUMS,
VENEZUELA, 1905-1918

Year	Population	Deaths from Leprosy	Rate per Million	Inmates in Leper Asylums December 31	Rate per Million
1905	2,609,108	81	31.0	—	—
1906	2,627,069	74	28.2	—	—
1907	2,649,995	51	19.2	666	251.3
1908	2,664,233	37	13.9	632	237.2
1909	2,685,432	48	17.9	621	231.2
1910	2,713,523	22	8.1	612	225.5
1911	2,743,833	24	8.7	611	222.7
1912	2,755,630	62	22.5	582	211.2
1913	2,780,281	57	20.5	523	188.1
1914	2,805,269	25	8.9	499	177.9
1915	2,818,173	45	16.0	676	239.9
1916	2,827,762	71	25.1	650	229.9
1917	2,848,121	33	11.6	626	219.8
1918	2,868,480	28	9.8	753	262.5

Data from Anuario Estadístico de Venezuela and Memoria del Ministerio de Fomento.

TABLE XVIII
MORTALITY OF LEPERS IN THE LAZARETTO OF BARBADOS
For the Period, 1890-1917
Males and Females

Causes of Death	Tubercular		Anesthetic		Mixed		All Types	
	Males No.	Females No.	Males No.	Females No.	Males No.	Females No.	Males No.	Females No.
Dysentery	2	1	2	—	—	—	4	1
Leprosy	125	79	21	29	3	4	149	112
Tuberculous Lungs	17	12	7	10	—	—	24	22
Other General	4	3	5	2	1	—	10	5
Apoplexy	—	—	6	3	—	—	6	3
Paralysis	1	1	3	2	—	—	4	3
Other Nervous	2	1	1	1	—	—	3	2
Organic Heart Disease	4	6	8	2	—	2	12	10
Other Circulatory	—	1	1	2	—	—	1	3
Respiratory	4	1	2	—	—	—	6	1
Diarrhea and Enteritis	7	2	3	1	—	—	10	3
Other Digestive	1	3	2	—	—	—	3	3
Bright's Disease	—	—	2	1	—	—	2	1
Other Urinary	1	—	1	—	—	—	2	—
Gangrene	3	3	1	—	—	1	4	4
Ill-defined	2	5	3	1	1	1	6	7
All Causes	173	118	68	54	5	8	246	180

Data from The Barbados Blue Book.

TABLE XIX
LEPROSY IN INDIA, 1911
Number of Lepers by Age and Sex

Ages	ALL INDIA			NATIVE STATES		
	Males	Females	Total	Males	Females	Total
Under 5	245	188	433	59	51	110
5-9	568	419	987	99	99	198
10-14	1,692	1,144	2,836	306	223	529
15-19	3,185	1,814	4,999	490	311	801
20-24	4,752	2,344	7,096	738	425	1,163
25-29	7,174	2,653	9,827	1,035	449	1,484
30-34	9,517	3,327	12,844	1,342	511	1,953
35-39	9,761	2,754	12,515	1,282	422	1,704
40-44	12,542	3,558	16,100	1,929	702	2,631
45-49	8,503	2,252	10,755	1,082	316	1,398
50-54	9,617	3,025	12,642	1,515	545	2,060
55-59	3,974	1,260	5,234	537	152	689
60-64	5,553	1,951	7,504	823	324	1,147
65-69	1,437	472	1,909	192	61	253
70 and over	2,438	892	3,330	356	125	481
Unknown	66	17	83	49	11	60
Total	81,024	28,070	109,094	11,834	4,827	16,661
Rate per 100,000 of population	50.2	18.2	34.6	32.5	14.0	23.5

Data from Census of India, 1911, Volume I.

TABLE XX
STATISTICS OF THE LEPER SETTLEMENT AT MOLOKAI, HAWAII
ADMISSIONS, INMATES AND DEATHS OF LEPERS, 1866-1919
Rate per 100,000 Population of Hawaii

Calendar Year	Admissions to Molokai		Number of Lepers in Molokai December 31		Deaths from all Causes	
	Number	Rate	Number	Rate	Number	Rate
1866 (a)	141	223.9	115	182.7	36	57.2
1867	91	146.9	170	274.4	24	38.7
1868	131	215.0	267	438.1	27	44.3
1869	190	317.0	392	654.1	59	98.4
1870	57	96.7	392	665.3	57	96.7
1871	178	307.4	518	894.5	52	89.8
1872	91	159.9	546	959.6	63	110.7
1873	415	727.1	810	1,419.1	142	248.8
1874	78	136.2	731	1,276.7	141	246.2
1875	178	309.9	754	1,312.7	149	259.4
1876	75	130.2	704	1,221.8	119	206.5
1877	122	211.1	694	1,200.6	129	223.2
1878	209	360.4	792	1,365.9	111	191.4
1879	92	149.0	688	1,114.2	194	314.2
1880	51	77.8	589	899.0	151	230.5
1881	195	281.5	654	944.0	129	186.2
1882	70	95.8	613	839.2	111	152.0
1883	300	390.6	763	993.3	150	195.3
1884	108	134.0	702	871.2	167	207.3
1885	103	125.4	663	807.1	142	172.9
1886	43	51.4	600	716.7	101	120.6
1887	220	258.0	708	830.2	111	130.2

(a) Settlement established January 6, 1866.

TABLE XX (Continued)

Calendar Year	Admissions to Molokai		Number of Lepers in Molokai December 31		Deaths from all Causes	
	Number	Rate	Number	Rate	Number	Rate
1888	571	657.4	1,033	1,189.4	236	271.7
1889	307	347.1	1,187	1,342.4	149	168.5
1890	185	205.6	1,213	1,347.9	158	175.6
1891	141	151.4	1,142	1,225.8	210	225.4
1892	105	109.0	1,095	1,136.7	152	157.8
1893	209	210.0	1,153	1,158.7	151	151.8
1894	129	125.6	1,123	1,093.7	159	154.9
1895	105	99.2	1,087	1,027.0	141	133.2
1896	142	130.3	1,115	1,022.7	114	104.6
1897	124	103.1	1,099	913.8	140	116.4
1898	75	57.0	1,059	805.3	114	86.7
1899	61	42.7	1,014	710.3	104	72.9
1900	109	70.8	983	638.3	134	87.0
1901	94	59.6	900	570.4	172	109.0
1902	80	49.5	874	540.9	106	65.6
1903	114	68.9	872	527.3	101	61.1
1904	92	54.4	856	506.0	107	63.3
1905	95	54.9	854	493.8	95	54.9
1906	64	36.2	834	471.9	84	47.5
1907	78	43.2	809	448.1	88	48.7
1908	32	17.4	771	418.3	59	32.0
1909 (b)	11	11.4	723	376.0	34	35.4
1910 (c)	47	24.6	614	321.3	90	47.1
1911	40	19.9	592	295.2	61	30.4
1912	91	43.5	622	297.4	64	30.6
1913	113	51.9	683	313.7	49	22.5
1914	67	29.5	666	292.9	75	33.0
1915	49	21.2	638	275.9	62	26.8
1916	57	24.0	629	264.7	66	27.8
1917	34	13.6	587	234.2	62	24.7
1918	89	34.7	608	237.3	67	26.2
1919	61	23.1	611	231.7	57	21.6

(b) Six months ending June 30.

(c) Years ending June 30, after 1910.

Source: For 1866-1908, Report of the Board of Health of Hawaii, 1909, p. 186; for subsequent years, see Annual Reports of the Territorial Board of Health.

TABLE XXI
LEPROSY IN HAWAII
TYPE OF LEPROSY
MOLOKAI, 1901-1913

Type	Number of Cases	Per Cent.
Tubercular	384	36.2
Anesthetic	327	30.9
Mixed	275	25.9
Not Given	74	7.0
Total	1,060	100.0

TABLE XXII
LEPROSY IN HAWAII
LEPERS BY RACE AND SEX
MOLOKAI, JUNE 30, 1918
Rate per 100,000 Population

Race	Males		Females	
	Number	Rate	Number	Rate
Hawaiian	210	1,780.7	157	1,419.9
Part Hawaiian	64	795.3	57	707.8
Korean	12	276.8	—	—
Portuguese	33	262.3	14	120.0
Spanish	2	162.6	—	—
Chinese	25	142.0	—	—
Filipino	12	65.4	—	—
Porto Rican	2	65.1	—	—
Other Caucasian	5	26.4	2	17.4
Japanese	12	16.3	1	3.0
Total	377	222.0	231	267.6

TABLE XXIII
LEPROSY IN THE UNION OF SOUTH AFRICA
NUMBER OF LEPERS IN INSTITUTIONS, BY COLOR, 1910 TO 1918
Rates per 1,000,000 of Population

Year	WHITE			COLORED		
	Population	Number	Rate	Population	Number	Rate
1910	1,255,545	144	114.69	4,621,531	1,678	363.08
1911	1,280,381	155	121.06	4,722,720	1,782	377.32
1912	1,305,217	184	140.97	4,827,114	2,042	423.03
1913	1,330,053	190	142.85	4,935,027	2,054	416.21
1914	1,354,889	186	137.28	5,046,585	2,006	397.50
1915	1,379,725	187	135.53	5,161,950	2,080	402.95
1916	1,404,561	193	137.41	5,281,266	2,088	395.36
1917	1,429,397	186	130.12	5,404,707	2,146	397.06
1918	1,454,232	175	120.34	5,532,455	2,055	371.44

Data from Quarterly Abstract of Union Statistics, Number One, January, 1920.
(Office of Census and Statistics, Victoria.)

TABLE XXIV

LEPROSY—UNITED STATES, 1920*

States	Number of known lepers in State January 1, 1920	Number of doubtful, additional or suspected cases	Number of cases officially segregated during 1919	Official (State) provisions for lepers
Alabama	0	1	0	Isolation.
Arizona	0	0	0	Strict quarantine—deportation to Island for Lepers. (?)
Arkansas	0	0	0	Not stated.
California	39	0	23	Leper colonies at San Francisco, Los Angeles, local isolation.
Colorado	3	0	3	Quarantine by county, pending removal to Government Lepro- sarium!
Connecticut	5	0	1	State aid—put in isolation hos- pital.
Delaware	0	0	0	Quarantined as other communi- cable diseases.
Florida	—	—	—	
Georgia	0	0	0	No provisions for lepers.
Idaho	0	0	0	Not stated.
Illinois	2	0	2	Isolated at county expense.
Indiana	0	0	0	No provisions for lepers.
Iowa	0	0	0	Not stated.
Kansas	0	0	0	No provisions for lepers.
Kentucky	0	0	0	State Board of Health would pro- vide in emergency.
Louisiana	87	—	87	Under State control, isolation, (Louisiana Leper Home.)
Maine	0	0	0	Not stated.
Maryland	0	0	0	Leper must be cared for where found.
Massachusetts	13	2	0	Leper Colony at Penikese Island.
Michigan	1	2	1	No provisions for lepers.
Minnesota	10	0	0	Under control of local Board of Health, isolated in own house- hold.
Mississippi	1	2	—	Not stated.
Missouri	Information not available			
Montana	1	0	1	Case isolated at county expense.
Nebraska	0	0	0	No provisions for lepers.
Nevada	0	0	0	No provisions for lepers.
New Hampshire	0	0	0	No provisions for lepers.
New Jersey	3	0	3	No provisions for lepers.
New Mexico	1	0	1	None other than modified isola- tion at home.
New York	28†	0	7	Every case investigated and diag- nosis made. Isolation. (?)
North Carolina	0	0	0	Not stated.
North Dakota	1	0	0	Controlled by local Board of Health.
Ohio	1	0	1	Isolated in home especially pre- pared on grounds of Dayton Quarantine Hospital.
Oklahoma	0	0	0	Not stated.

*Results of special inquiry in co-operation with State and local Departments of Health.

†New York City only.

TABLE XXIV (Continued)

States	Number of known lepers in State January 1, 1920	Number of doubtful, additional or suspected cases	Number of cases officially segregated during 1919	Official (State) provisions for lepers
Oregon	1	0	1	Isolation.
Pennsylvania	6	0	—	
Rhode Island	0	0	0	No provisions for lepers.
South Carolina	2	0	0	Not stated.
South Dakota	0	0	0	No provisions for lepers.
Tennessee	0	0	0	No provisions made.
Texas	33	0	—	Not stated.
Utah	0	0	0	None except notification and casual quarantine or segrega- tion.
Vermont	0	0	0	Not stated.
Virginia	1	0	1	Cared for by local authorities.
Washington	1	0	1	Isolated.
West Virginia	0	0	0	No provisions for lepers.
Wisconsin	2	0	1	Isolated—and attendant provided.
Wyoming	0	0	0	Placed in pesthouse same as any other contagious disease.
Dist. of Columbia	0	0	0	Isolation remote from persons not having disease.
Total	242	7	134	
Porto Rico	37	—	—	There is a law for isolation and segregation.*

*See footnote page 17.

THE PRUDENTIAL INSURANCE COMPANY OF AMERICA

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HOME OFFICE, NEWARK, NEW JERSEY